



FIG. 5—EARLIER SACRA VIA AND BASILICA OF CONSTANTINE

## Recent Excavations in Rome

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MY pleasure in accepting your invitation to address you here to-night is increased by the fact that I appear to be the successor of Professor Lanciani, my teacher in Roman topography, to whom, in common with many other of his old pupils and friends, I shall always feel a debt of gratitude. Since he delivered his address on "Architectural Results of the Latest Excavations in the Forum," no one has spoken to you on the subject of recent discoveries in Rome, and therefore, while not desiring to confine my attention to the Forum or the Palatine, the excavations of both of which are under the direction of Commendatore Boni, I think it may be well to begin by telling the story of those excavations from the point where he left it up to the present day. The excellent restoration of the centre of Rome (*Media Pars Urbis*) by an old student of the British School at Rome, Mr. H. C. Bradshaw [*A.*], will serve to illustrate the greater part of this paper.

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One of the most important results has been the confirmation which has been obtained of certain statements of our ancient authorities in regard to the early history of Rome, which had previously been doubted by hyper-critical historians. Thus we may, I think, take the Palatine as the original nucleus of Rome, even though the wall of Romulus probably never existed. The Palatine was sufficiently defended by its lofty cliffs and by the two marshy valleys which nearly surrounded it. Remains of a cemetery which began to be used about 750 B.C., that is about the date of the traditional foundation of Rome, have been found in the Forum near the Temple of Antoninus and Faustina, though this cemetery probably belonged to a somewhat enlarged community: it ceased to exist about 550 B.C., when the city of the Seven Hills came into being, and it became necessary to make use of the two marshy valleys above mentioned, which now were drained and converted respectively

into the Forum and the Circus Maximus—the civic centre and the place of recreation. Tradition ascribes to Tarquinius Priscus the construction of the Cloaca Maxima at this very date, and scanty traces of it have actually been found; it appears to have been an open channel, but several of its branches, constructed of the same material, a grey volcanic tufa, have been preserved, and may, I think, claim to be by two or three centuries the earliest Roman arches in existence (Fig. 1).

To the same period—again that to which tradition ascribes it—belongs the earliest city wall of Rome, which probably did not include the Aventine, built of the same material, the blocks used being about a foot high, and also the Temple of Jupiter Capitolinus, further remains of which have recently been brought to light, belonging entirely to the podium (Fig. 2). Of the superstructure nothing is left, and even of that of Imperial days hardly a trace has been found, but quite a new light has been thrown on the character of the terra-cotta statues which adorned the original temple, the work, according to Pliny, of Vulca, an artist of Veii, by the discovery at Veii itself of portions of a very fine group of painted terra-cotta statues, including a splendid Apollo.

The same tufa may be found in several early buildings in the Forum, notably in the original podia of the temples of Saturn and of Castor and Pollux, both of them attributed to the beginning of the fifth century B.C.; and I think it is not too much to say that we are on fairly safe ground in attributing any buildings in which we notice the use of capellaccio, as this particular kind of tufa is called, to, roughly, 550 to 450 B.C.

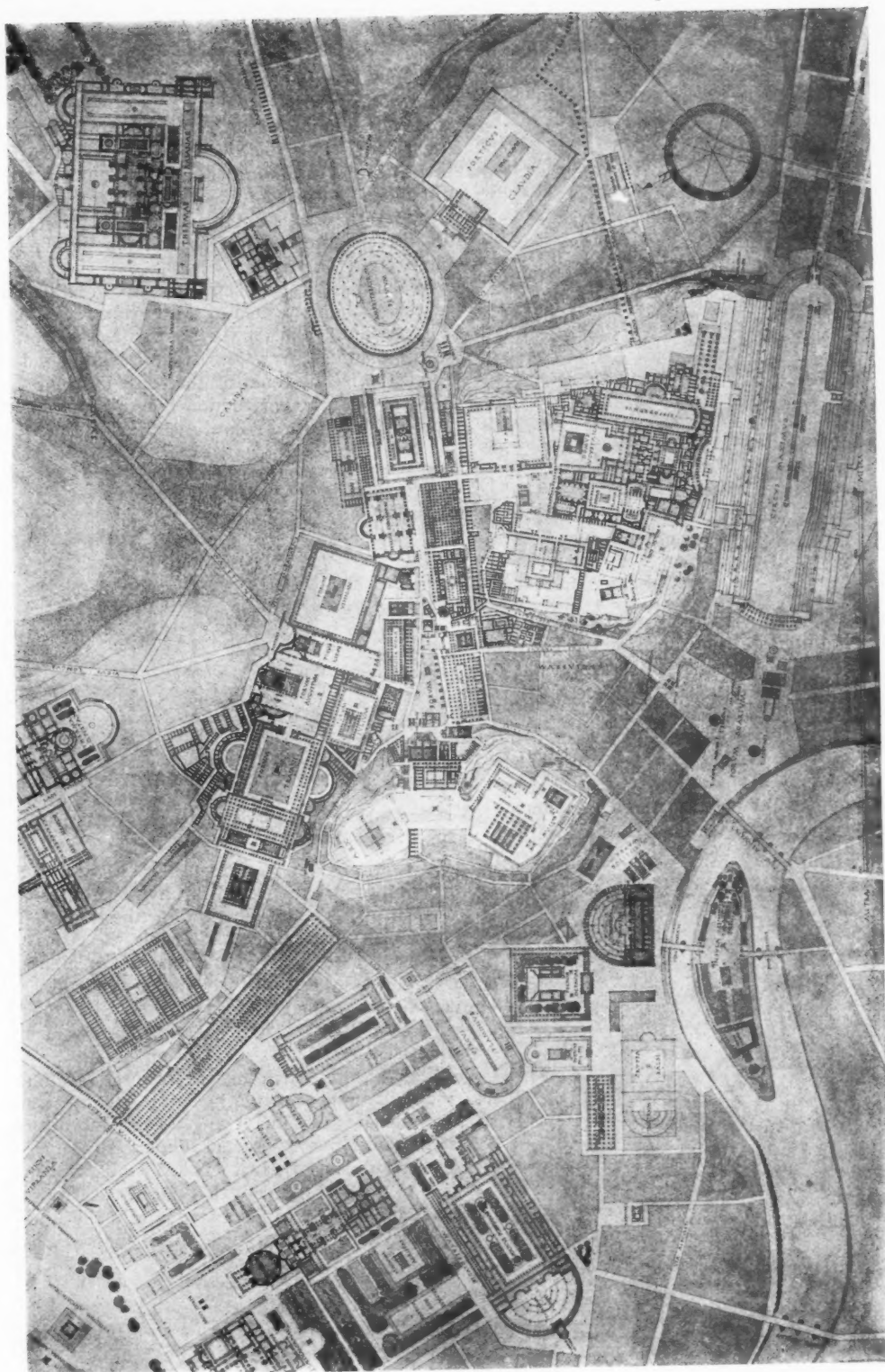
Of the succeeding two centuries we know very little. In the successive reconstructions of the shrines and sanctuaries of the Republican Forum the remains of the original structures were not altogether destroyed, and thus in the pavement of the Lacus Curtius and in the shrine of Venus Cloacina we may trace a succession of different building materials, each belonging to a different reconstruction, and testifying to a gradual rise in level.

This rise in level may be strikingly exemplified in the case of the Curia. We can see the level of the original marble dado of the exterior (immediately to the left of the blocked door), then we can see the bottom of the door posts of the eleventh century building, about half way up, to the modern

threshold, which has itself been raised 2 or 3 feet since the beginning of the seventeenth century. The Curia as it stands is a reconstruction of the time of Diocletian, but it occupies the site of that of Caesar.

Other changes may be seen in the Rostra, the platform from which speakers addressed the people assembled in the Comitium. Various changes in orientation as well as in level seem to indicate that the Curia, or Senate House, originally placed by the kings on the north side of the Comitium, must also have changed its orientation more than once; but until the excavation can be extended further to the north-east it will be impossible to hope for a solution of the problems which present themselves in this connection. A break with tradition had already been made in 145 B.C., when for the first time a tribune turned his back on the Comitium to address the people in the Forum; but it was Julius Caesar who transferred the Rostra to the north-west end of the open area of the Forum, which lay between the two basilicas which had sprung up behind the two rows of tabernae. This change made it possible to give the Forum a proper architectural setting. On each side of the open space there was to be a magnificent basilica, the Curia was to be reconstructed, and the whole of the open area of the Forum paved; but Caesar's death cut these projects short, and it was not until Augustus returned to Rome as a victor that he was able to bring them to completion.

There was one addition to the scheme. The temple of Caesar, at the other end of the Forum proper, was raised to his memory by Augustus. The very spot on which the body of the great Dictator was burnt is included in the façade—a semi-circular niche enclosing the actual slabs on which the impromptu pyre was raised—a case unique in architecture; and in this niche, perhaps the most impressive spot in the Forum, is the base of the monument which had been erected immediately afterwards. Of the temple itself but little is preserved; the blocks of marble and stone of which it was constructed were removed in the Middle Ages, and almost nothing is left but the concrete core. It was erected on the site of the street which bounded the Forum, as Caesar had planned it, on the south-east. Parallel to this street there is a line of small rectangular pits, stone lined and covered with slabs of stone, and similar pits have been found on two of the other three sides.



RESTORATION OF THE CENTRE OF ROME (MEDIA PARS URBS)  
By H. Chalton Bradshaw [A.], Rome Scholar 1913



FIG. 1.—EARLY DRAIN NEAR THE TEMPLE OF SATURN

Three lines of similar pits run along the boundary between the Republican Comitium and the Forum, closely associated with the earlier Rostra. These pits must have had some ritual significance which is unknown to us.

In the course of the reconstruction by Augustus the open area was repaved at a level slightly higher than that of Caesar. An aerial photograph has revealed the existence of an inscription in letters a foot high, once filled up with bronze, showing that the pavement had been laid by one *L(ucius)*



FIG. 2.—ANGLE OF THE PODIUM OF THE TEMPLE OF JUPITER CAPITOLINUS

*Naevius L(uci) F(ilius) Surdinus Pr(ector)*. We know of a man of this name who was *triumvir monetalis* about 15 B.C., with whom he may be identified. This discovery at once led to the identification of a number of monuments of which our ancient authors speak—the site of the praetorian tribunal, the Lacus Curtius, the enclosure in which stood the statue of Marsyas and the fig, vine and olive, etc.

We have not yet spoken of the two great basilicas by which the open area of the Forum was flanked. The Basilica Julia on the south was, as we have seen, planned by Caesar and completed by Augustus. The building that now lies before us, however, is a reconstruction by Augustus himself upon a larger site. Towards the Forum it pre-

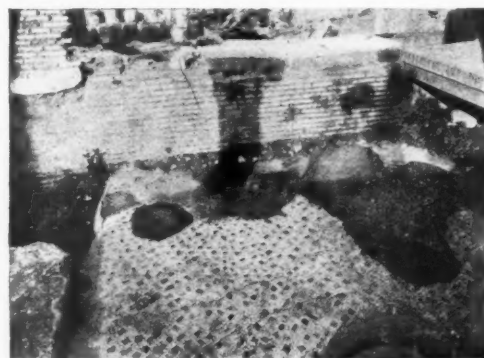


FIG. 4.—PAVEMENT OF THE REPUBLICAN ATRIUM VESTAE

sented a long series of arcades in two stories; on entering them one passed through the outer vestibule into the aisles surrounding the main hall or nave, which had a flat roof, while the aisles were vaulted. Only the foundations of the pillars are now preserved, except at the north-west end. The central hall was lighted by a clerestory, like the nave of a cathedral. At the back was a row of small rooms (*tabernae*) used as offices or shops.

The Basilica Aemilia was restored even more frequently, and the building before us, now so much ruined that it is difficult to get a general idea of it, is the building re-erected under Augustus and restored under Tiberius. It was similar in appearance to the other, except that the Doric arcade (the west end must have been standing in the fifteenth century) was a good deal more massive, as its



fragments show. As it was on the sunny side of the Forum, a row of *tabernae* was placed inside the front arcade. The fate of the building has been made clear by recent excavations. A fire, probably at the beginning of the fifth century, destroyed the interior; this is clear from the coins which have been found on the marble pavement of the nave. No attempt was made to rebuild it, but a large mediaeval house was erected in it. Three and a half centuries later came another catastrophe—the great earthquake in the time of Pope Leo IV—and this and other buildings in the Forum became a mass of ruins.

Of the temple of Caesar we have already spoken. The temple of Castor and Pollux close by it is, as we have seen, of very ancient origin, but the famous three columns and the massive stone and concrete podium on which they rest belong to another restoration, carried out by Tiberius in the time of Augustus (Fig. 3). Much of the stone has been removed by the builders of Mediaeval and Renaissance Rome, and this makes it difficult to understand the arrangements of the temple, which had small rooms between the foundations of the columns, used as offices. We know, for instance, that the weights and measures office was here, just as the Temple of Saturn served as the State Treasury. But the lofty bases of all these temples were also designed as a protection against flood. Horace's *vidimus flavum Tiberim ire deiectum monumenta regis templaque Vestae* was a reality as late as 1900.

Recent excavations have brought to light fragments of the back pediment and colonnade of the temple, and we are thus able to obtain a good idea of the beauty of the carving of the architectural members, despite the great height at which it was placed. We have no record of the existence, after the Dark Ages, of more than three columns, and we may suppose that the earthquake of Leo IV was in this case also responsible for the destruction of the temple.

Just below the temple of Castor and Pollux lies the *Lacus Juturnae*, originally a pond, later paved with slabs of tufa, in which horses could be actually watered. What we now see, a rectangular basin lined with marble with a base in the centre, is a formalisation of this. On the base there stood statues of the Twin Brethren holding their horses (supposed to be original works of Greek art of the fifth century B.C. from Southern Italy), broken into small pieces when paganism finally died out. Behind is a small chapel erected to Juturna, with a

well in front of it—(*Fons Juturnae*). The puteal, or well head, is of white marble, and dates from the early empire. In front is an altar with Juturna and her brother Turnus, familiar figures to all readers of the *Aeneid*.

Close to the well of Juturna stood, as was fitting, the round temple of Vesta. Only its foundations remain, but enough fragments have been found to give us an idea of its appearance. They date from the reconstruction by Julia Domna, the wife of Septimius Severus, as, indeed, does the House of the Vestals—generally known as the Atrium Vestae, from the large court surrounded by a portico which forms its central feature.

The oldest portions now above ground date from the time of Nero, but recent excavations have brought to light traces of the Atrium Vestae of the end of the republic, with mosaic pavements, etc., below the level of the later building (Fig. 4). The Romans did not, as we do nowadays, completely clear the site of a new building, but left the floors and walls of the building they destroyed or superseded lying often only a few inches below the new pavements; and as this process was often repeated several times we are able to gain far more information by the excavation of the site of a Roman city than would be possible supposing that modern London were to fall into ruins and be excavated two thousand years afterwards. The orientation of these earlier foundations corresponds with that of the Temple of Vesta and of the Regia, the entrances of both of which faced due east.

Nero's reconstruction of the Atrium Vestae was only a part of a grandiose building scheme which transformed the whole of the topography of this part of Rome. Before the time of Nero the Sacra Via ascended the ridge of the Velia in a slight curve, and the very paving stones on which Horace may (Fig. 5) have been strolling when he met his unfortunate friend, have been brought to light: but the erection of the Golden House after the fire of 64 A.D. involved the provision of an adequate approach to a group of buildings which, we should remember, covered an area greater than that of St. Peter's and the Vatican, including the garden. From the temple of Vesta, a huge portico, of which only the foundations remain, led up to the vestibule on the summit of the Velia. These foundations, which were identified, correctly in my judgment, by an American archaeologist, Miss Van Deman, cut through the remains of a large and important

republican house, or it may be a group of houses, of which no report has yet been published. The foundations of other buildings on the same orientation have been found under the Basilica of Constantine, and the Sacra Via was obviously laid by Nero to run in a straight line up to the entrance of the Golden House between two porticoes. The site of the Colosseum in the valley beyond was occupied by an ornamental lake, and the principal palace lay to the east of it.

The unpopularity of Nero's appropriation of such an immense extent of ground, almost in the centre of the ancient city, is clear from the eagerness displayed by his successors in restoring it to public uses. Vespasian constructed the Colosseum in the centre, Titus built baths opposite to it, but a fire in his reign appears to have rendered uninhabitable that part of the Palatine which had escaped the conflagration of Nero, and Domitian was entirely occupied in the reconstruction of the imperial palaces on that hill. It was only Trajan who found himself able to surrender the main palace of the Golden House, and to erect on its site those immense baths which had been attributed to Titus until Professor Lanciani correctly identified them in 1895; and this is why the numerous drawings of the paintings of the Golden House which have been made since the fifteenth century, when Raphael's pupils drew inspiration from them for the decoration of the Loggia of the Vatican, have always been attributed to the Baths of Titus. Finally, Hadrian erected on the site of the vestibule, the extent of which we may judge from the position of the Arch of Titus, pushed up into a corner as it is, the great double temple of Venus and Rome. The two apses lie back to back, and were surrounded by porticoes. It might be well to mention that the brickwork of the whole superstructure belongs to a reconstruction of Maxentius. We shall find when we reach the Palatine that much more may be done in the way of dating brick-faced concrete than has hitherto been attempted, and the researches of Miss Van Deman and others have thrown new light on many problems, just as the dating of entablatures will be found to have been carried a good deal further when a posthumous work by the late Fritz Tobelmann, a German archaeologist who was killed in the first month of the war, is published. It will, we may hope, no longer be possible for authorities to differ as to whether the cornices of the temples of Mars Ultor and of Castor and

Pollux are to be attributed to the reign of Augustus or that of Hadrian, or whether that of the Regia belongs to the time of Augustus, or to that of Diocletian (Fig. 6).

From the Arch of Titus a branch road, known as the Clivus Sacer, ran up to the area between the two main imperial palaces on the Palatine, following the line of the original road of approach through the primitive settlement. In the last century of the republic its vicinity to the Forum made the Palatine the favourite residence of the great men of Rome. Several houses of this period have indeed been found. To name no more, Cicero and his brother, his clients M. Aemilius Scaurus and Milo, his enemy Catiline and his opponent Hortensius all had houses on the Palatine, and there is now little doubt that the last named is preserved to us, and was, unlike the rest, never obliterated by the enormous substructions of the imperial palaces. Augustus bought the house that had belonged to Hortensius,\* "remarkable" as Suetonius says, "neither for its size or its adornment; its porticoes were small and built of Alban stone, and its apartments were without any marble decoration or exquisite pavements." To it he added an atrium in which the Senate could meet, but the house itself remained a modest one; and it is to be recognised in what has hitherto been known as the house of Livia, the painted decorations of which belong to this period. We may notice that just as the "house of Romulus" and the "hut of Faustulus," the shepherd who gave him shelter, lasted on until the Christian period, so the house of the founder of the empire was respected by later rulers, who preferred to erect vast arches to support the enlargements of their buildings rather than sweep away the humble dwelling of their great predecessor.

On the site of another republican house close by (perhaps that of Antony, as Professor Richmond thinks), Augustus erected the temple which he had vowed to Apollo after the victory of Actium. No other temple than this could have been superimposed upon a house of the late republic, for all the other temples of which we have record on the Palatine belong to a much earlier period. And if we read the *Carmen Saeculare* in the light of the new theory, it gains point and force when we look from the temple steps straight across to the Aventine sacred to Diana (*quae Aventinum tenet Algi-*

\* For all this see Richmond: J. R. S., iv, 1914, 193.

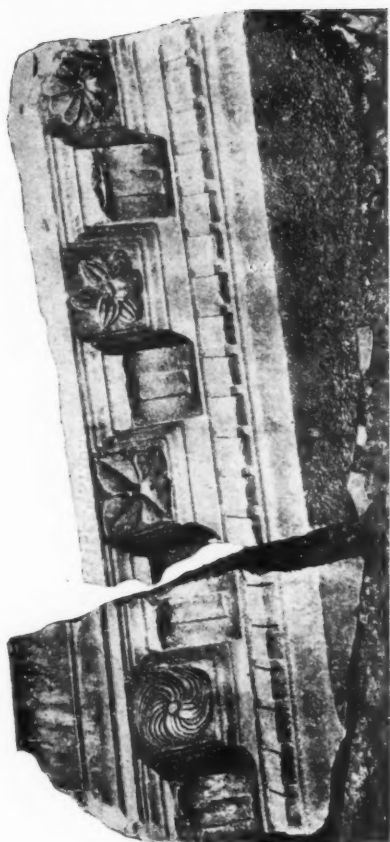


FIG. 6.—CORNICE OF THE REGIA (PERIOD OF AUGUSTUS)



FIG. 3.—TEMPLE OF CASTOR AND POLLUX. VIEW FROM THE PALATINE



FIG. 7.—PALACE OF TIBERIUS (*Lacus Juturnae* IN FOREGROUND)

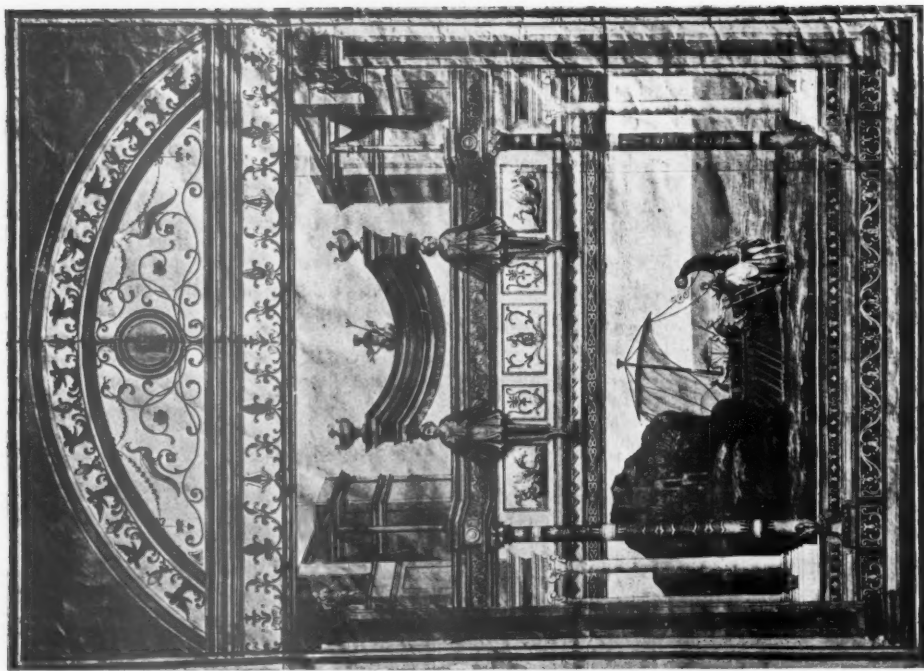


FIG. 9.—DRAWING IN THE TOPHAM COLLECTION, ETON COLLEGE (VI. 3)  
From a house under the Basilica of the Flavian Palace

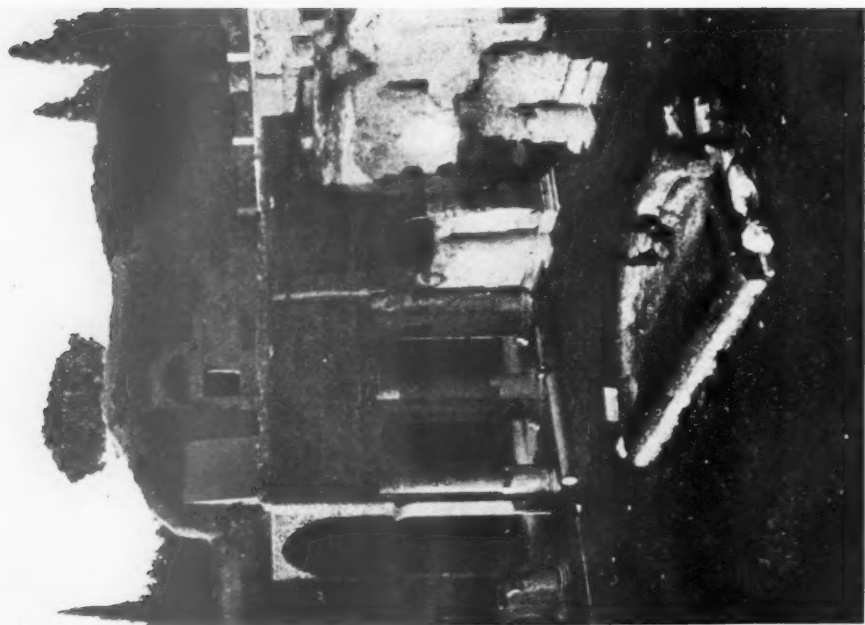


FIG. 10.—"STADIUM" OF THE FLAVIAN PALACE



*dumque*), whereas from the other sites proposed the Aventine would have been hardly visible—to the temples of Fides on the Capitol and of Pudicitia in the Forum Boarium, or down the valley of the Circus to the temple of Honor and Virtus at the Porta Capena—no mere abstractions introduced to fit the metre, but deities whose shrines were actually in sight.

The successor of Augustus, Tiberius, erected the first of the great imperial palaces on the north-west summit of the hill known as the Cermalus. (Fig. 7, p. 559). Caligula extended it towards the Forum, and we are told that he considered the Temple of Castor as the vestibule of the palace.\* That this is no mere rhetorical exaggeration has been shown by the recent discovery under the floor of S. Maria Antiqua † (see below) of an open water tank, once lined with marble, which must have once stood in the middle of a great peristyle or courtyard, and is orientated with the palace of Tiberius. Of his bridge from the Palatine to the Capitol, which was destroyed by his successor, no remains, naturally, exist.

It was probably Claudius, on the other hand, who constructed a splendid and magnificent residence on the south-east summit of the hill, the Palatium, some remains of which were known as many as 200 years ago under the name of the "Baths of Livia," while other portions, discovered in the early eighteenth century, have only just been brought to light. Drawings of them, made to the order of Dr. Topham, are in the valuable library which he bequeathed to Eton College. This palace was in two storeys, and was decorated with paintings and pavements of coloured marbles of great beauty.

Nero had already planned a huge palace which should join the Palatine with the Esquiline (*domus transitoria*), when the fire of 64 A.D. which destroyed it enabled him to realise his projects in still larger measure. But on the Palatine he had time to do but little, and we can attribute to him nothing but a few foundations, which were driven through the burnt remains of the palace of Claudius. The palace of Tiberius, on the other hand, seems to have survived this fire, but to have been seriously damaged in another conflagration in 80 A.D., a little

after the return of Titus from Jerusalem. But in any case Titus and his father did not regularly inhabit the Palatine; Vespasian, we are told, lived there but little (if the palace of Tiberius had not survived he could not have lived there at all), preferring the Horti Sallustiani on the Pincian Hill. It was thus on Domitian, after the imperial residences on the Palatine had been entirely laid to waste, that the task of reconstruction fell. It seems likely that he first devoted his attention to the



FIG. 8.—BALCONY OF THE PALACE OF TIBERIUS AS RESTORED BY DOMITIAN

palace of Tiberius and Caligula on the Cermalus, and what is known as the "Bridge of Caligula" above the Clivus Victoriae is simply a balcony in two storeys, which served to "finish off," so to say, the huge arched substructures of this palace—a balcony which may also be traced at the east angle of this vast pile (Fig. 8). He also constructed, or at any rate began, a new approach to the Palatine from the Forum on the same site as the vestibule of Caligula, and the great hall known as the Temple of Augustus and the two halls behind it, which in the sixth century A.D. became the church of St. Maria Antiqua, are ante chambers to the series of inclined

\* Suet. Caligula 22: partem Palatii ad forum usque promovit aede Castoris et Pollucis in vestibulum transfigurata.

† S. Maria Antiqua was destroyed in the earthquake of Leo IV., and was immediately succeeded by S. Maria Nova, founded by the same Pope on the site of the temple of Venus and Rome.

planes which lead up from the Forum to the Clivus Victoriae. But the huge arches which span the road, and which extended the area of the palace considerably towards the Forum—so much so as to take away all sun and air from the unlucky Vestal Virgins, whom we find making all sorts of alterations in their house in order to keep out the damp—are due to one of his successors, probably Trajan, and at the same time were built the vaulted chambers on the south-west near the house of Augustus. It is very noticeable how the humble dwelling of the founder of the empire was respected by all his successors, who preferred to build huge arched substructions (rather like the extensions of Waterloo Station) to carry their palaces rather than encroach on his house. Of the superstructure of the palace of Tiberius nothing is left, and the area is now occupied by a lovely garden. Below this, on its south-east side, runs a crypto-porticus, or covered gallery, in one portion of which fine ceiling decoration is still preserved, generally associated with the murder of Caligula, but wrongly, for we are told that not a night passed without some ghostly visitation in that house until it was destroyed by fire; and further, a smaller and earlier passage has recently been discovered not far off where it is far more probable that the deed was done. From this crypto-porticus a branch leads to the far larger palace which Domitian erected on the remainder of the hill, upon the ruins of the palace of Claudius, and of one or more houses of the Republican period, themselves covered by other buildings. Some of these also came to light in the early eighteenth century (Fig. 9). Its main entrance was approached by the Clivus Sacer, of which we have already spoken, which was spanned by an arch erected in Domitian's honour, but demolished, like his equestrian statue, after his death. His palace falls into five main sections:—

(a) The state apartments on one floor only (whereas the earlier palace of Claudius had two), grouped round a very large peristyle, with a shallow open tank in the centre. On the north-east are two great halls, the one in the centre 100 feet wide, with a smaller one, a basilica in plan, on the left, and a still smaller room (perhaps a lararium) on the right. On the opposite side of the peristyle is a very large triclinium, or state dining room, facing north-east, and therefore intended for use in summer. On each side of it windows opened into a nymphaeum, a room with a fountain basin in the centre.

(b) The residential portion, a part of which, approached by a staircase with a curiously modern light well, lies at the lower level, the rooms being grouped round a courtyard, while the rest, at a higher level, is now incorporated in the Villa Mills, an architectural monstrosity about a century old in the Strawberry Hill Gothic style, built by and belonging to an Englishman named Charles Mills.

(c) The so-called Stadium or Hippodrome, which (as we learn from a letter of Pliny the younger) was a favourite shape for a formal garden—a walled space at the lower level surrounded by arcades, the top of which is at the upper level (Fig. 10). On the further side from the Villa Mills is the great *Exedra*, a huge semi-circular domed niche, perhaps added by Hadrian, who seems to have been responsible for the construction of the *thermae* adjacent to it, which are not well preserved.

(d) The portion of the palace to the south-east of the garden, all at the upper level and reached from the top of the arcades. The superstructure is almost entirely ruined. This last portion of the palace was much added to by Septimius Severus, who constructed a series of enormous arched substructions, a considerable part of which has fallen. His famous Septizonium, the last ruins of which were destroyed by Pope Sixtus V., was simply intended to mask these unsightly rows of arches.

(e) The great walled square at the south-east angle of the hill, probably the *Horti Adonis*, marked by the church of S. Bonaventura on its south-west edge and of S. Sebastiano in the centre. Here some authorities wrongly place the temple of Apollo.

Otherwise, with the few additions we have noted, the Palatine remained much as Domitian had planned it; and he has left his mark on it, just as Julius Caesar and Augustus are responsible for the main outlines and for much of the actual building in the Forum.

I could wish that it were possible for me to tell you something in regard to the excavations of the Imperial Fora. I can at least say that Professor Lanciani is the president of a commission which has been entrusted with considerable powers and funds for the acquisition of their sites. Modern Rome is confronted with precisely the same traffic problem as that which the emperors, down to Trajan, had to deal with, until he finally solved it by occupying the whole space between the Capitol and Quirinal with his great Forum, the internal decoration of which, as a recently discovered draw-



FIG. 11.—BASILICA AT PORTA MAGGIORE (an aisle)

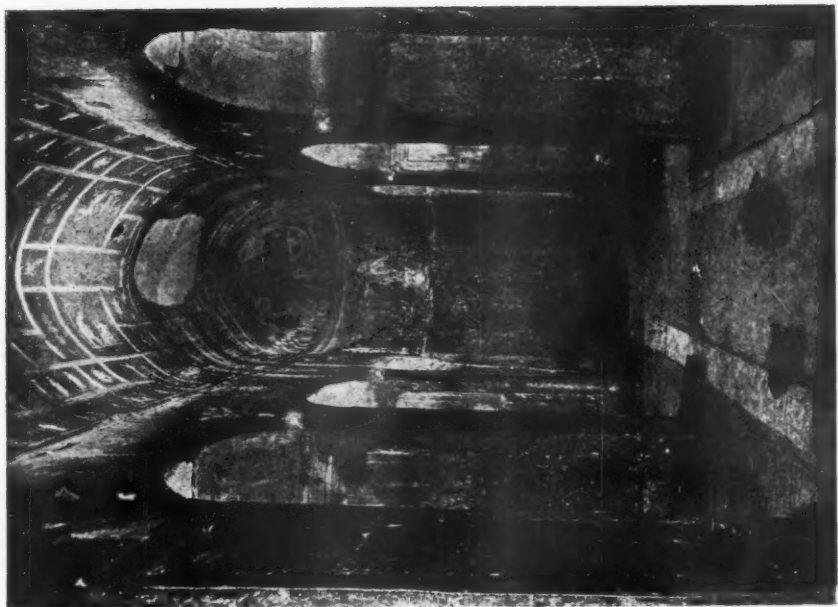


FIG. 12.—BASILICA AT PORTA MAGGIORE (the East end of the Nave)



FIG. 13.—BASILICA AT PORTA MAGGIORE (Semi-dome of the apse)

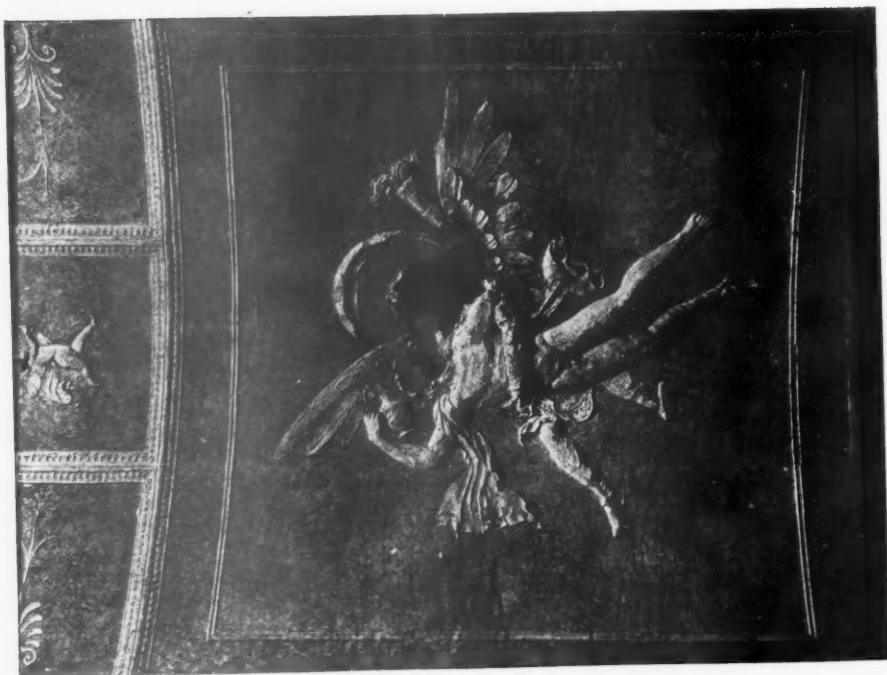


FIG. 14.—BASILICA AT PORTA MAGGIORE : RAPE OF GANYMEDE  
(Detail of the vault of the nave)



ing shows, was identical with that of the Forum Transitorium, columns projecting slightly in front of an enclosure wall. (Professor Lanciani might, indeed, write to one of his friends of to-day in much the same terms as those that Cicero used in writing to Atticus to tell him of his share in carrying out the projects of Julius Caesar. (*Ad. Att.* iv. 16.)

The account I have just given you must be treated as provisional in so far as it may have to be revised when the full official account of these excavations, which have been carried on in the very centre of the capital of the ancient world, is vouchsafed to us. The case is somewhat different in regard to the other discoveries of which I have to speak to you, for all of them have been described in more or less detail in official publications. From these, indeed, are taken the photographs which I shall now proceed to show you.

No discoveries of first rate importance have been made of recent years within the centre of the modern city, but it is worth noting that the construction of two large banks in the Piazza Colonna, one of them the Banco di Sconto, of which a good many of us heard a little too much at the beginning of the year, led to the discovery of a large group of blocks of houses of the middle of the second century A.D., and not of the Porticus Vipsania, which apparently did not extend so far to the south as had hitherto been believed.

The exploration, under the direction of Professor Lanciani, of the substructions of the Baths of Caracalla, have thrown great light upon the details of the construction of these baths, and have brought to light the largest sanctuary of the Persian Sun God Mithras that is known to us—which was introduced there at a later date. Considerable work has also been done in the outlying portions of the baths, which would now form an excellent subject of study for one of our architectural students.

I may add that though there has been a good deal of building activity in the central portion of Rome during the last few years, the other few important outstanding discoveries with which I shall deal have all been made in the outskirts, and all either during or since the war. First of all comes the famous basilica near the Porta Maggiore, which was discovered in 1917 owing to a landslip under the Naples main line, caused by the presence there, hitherto unsuspected, of the light shaft of its vestibule. The exact date to which it belongs, and the

purpose which it served, are still the subject of much controversy. Personally, I am inclined to accept the theory that it belonged to the Statilian family, a member of which, T. Statilius Taurus, was accused of magical practices by Agrippina, the wife of Claudius, and took his own life to escape a worse fate. I am inclined to think, too, that the desire for secrecy explains the method of construction. It would seem that the concrete of which the walls and piers were constructed was poured into pits sunk in the virgin soil, which was also used to support the vaults while hardening. When the concrete had set the earth was removed and the interior of the building cleared from beneath, so as not to attract attention. The interior was, indeed, approached by a long corridor leading into a vestibule, a shaft in which gave light indirectly to the basilica itself; this has a nave and two aisles (Fig. 11), separated from one another by pillars supporting arches (Fig. 12). The walls and vaulting are decorated in white stucco. The figures and scenes are not in themselves difficult of interpretation, though the principle of their selection is not at first sight obvious. Mrs. Strong, however, who interprets the difficult scene in the apse as one of purification by the ordeal of water (Fig. 13), points out that all the other scenes can be referred to the wanderings of the soul and its progress towards its final goal\* (Fig. 14).

Not very far off, in the Viale Manzoni, a hypogeum of quite a different character and date, has still more recently been discovered. Above it was a lofty brick tomb of a type familiar enough to us in the Via Appia and the Via Latina, in the base of which (the only part preserved) is a sepulchral chamber with arcosolia and burials in the floor. The paintings are damaged, but Adam and Eve may clearly be recognised. Just outside is a staircase leading to a landing, on the left of which is the entrance to a subterranean chamber with vaulted roof and a large light shaft in the centre, and an arcosolium on the right and left. The paintings with which this chamber is decorated have recently excited considerable interest owing to the fact that an incautious correspondent announced the discovery here of contemporary portraits of Peter and Paul (Figs. 15, 16). It is not impossible that they may be recognised in two of the twelve male figures which decorate the lower part of this wall, but there is no doubt that the paintings cannot be earlier than

\* See Mrs. Strong's article in *Journal of Hellenic Studies*.



FIG. 15.—PORTRAIT OF S. PETER (?)



FIG. 16.—PORTRAIT OF S. PAUL (?)

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the end of the second or the beginning of the third century A.D., and not B.C., as an unfortunate misprint made me state in my letter to the *Literary Supplement of the Times* in December, 1921. The paintings on the upper part of the wall have not yet been interpreted with any certainty. It is generally agreed that they are Christian, but some have desired to see gnostic influence in them. I myself are rather inclined to suppose that there was a certain amount of intentional concealment of their Christian character; thus, the scene which very likely represents the Sermon on the Mount might, to a pagan, represent any shepherd with his flock below him, and the interesting scene which shows a man on horseback met outside the city by a cortege of persons who have come to do him honour might be intended to recall to the Christian beholder Christ's entry into Jerusalem, a small donkey feeding in the background giving him the key to the true meaning of the scene. The Good Shepherd, several times repeated in the vault, might just as well be Orpheus: while the group of twelve draped male figures which is found in the other chamber is flanked on each side by a group of six men and six women in pairs, who certainly cannot represent the twelve apostles.

The building we have just described lay close to the Via Praenestina before its divergence from the Via Labicana, and a number of interesting tombs have recently been found on some of the other high roads which radiate from Rome. An especially

interesting group is that which has come to light on the Via Ostiensis, near the church of St. Paul, outside the walls. The tombs fall into four different periods, and the best of them are some columbaria (which take their name from the small niches, like those of a dovecot, in which the cinerary urns are placed) belonging to the second period, from the beginning of the empire to the end of the second century after Christ.

Some other columbaria have been found under the church of S. Sebastiano on the Via Appia, which are especially interesting from the freedom of their style and the beauty of their stucco decorations—in one is a peacock with the tail shown in colour, while in the other the ceiling of the principal chamber is covered with the tendrils and bunches of grapes of a vine springing from the angles.

A little beyond the church a tomb has been found which marks the transition between cremation and inhumation (beginning of the third century A.D.), having been constructed from the first, with eleven small niches for urns and three recesses for bodies.

The foregoing account cannot pretend to be in any way complete. Many discoveries of minor interest have, perforce, been omitted, and those which I have described have not been dealt with with as much detail as they deserve. Even as it is, I fear that I may have abused your patience; if I have done so I can only plead my own interest in the subject, and hope that I may have succeeded in awakening yours.

## Discussion

### THE PRESIDENT (MR. PAUL WATERHOUSE, M.A.) IN THE CHAIR

The PRESIDENT: I have the pleasure to say that the vote of thanks will be proposed by Commendatore Lanciani, whose name is known to all students as a great pioneer of Roman excavation.

COMMENDATORE LANCIANI, D.C.L. (Honorary Corresponding Member): It is with pride and pleasure that I have accepted the request of the Council of our Institute to move a vote of thanks to Dr. Thomas Ashby for his interesting and exhaustive lecture on Recent Excavations at Rome. I must also tender him the expression of my personal gratitude for the kind mention he has made, more than once, of my name in connection with archaeological exploration in the field of Roman antiquities. Questions of dates at my age are not exhilarating nor satisfactory, but I cannot help remembering that we have been friends and co-workers for a trifle over a quarter of a century, and that in such a

comparatively long lapse of time, of almost daily intercourse, our friendship has never been obscured by a passing cloud. The memory of the happy years *ante bellum*, when we were wont to explore together peaks and dales of the Sabine, Prenestine and Alban ranges, when, after reaching our goal, we shared our delightful piece of stale bread sitting on the conquered pinnacles, and feeling *mens sana in corpore sano*; the memory of those days, I say, will never fade away. On the contrary, the nearer I approach the end of my career, the stronger those happy ties become.

Dr. Ashby's subject, "Recent Excavations in Rome," was a difficult one to treat, on account of the *embarras du choix*. It seems that no war, no political unrest, no financial distress, can interfere with the fecundity of Rome's sacred soil; in fact, more excavations have been made—although for a different purpose—and

more discoveries have taken place since 1914 than in the previous peaceful decade. Dr. Ashby's scheme and frame of speech was rather synoptical; it could not have been otherwise in view of the enormous number of facts he had to mention without entering into details. I shall mention but one or two instances.

Just before we left Rome—I left it before he did—a tremendous discovery was being made, which may shake the foundations of our belief in the Roman traditions. On the top of the Mons Vaticanus (Monte Mario) an archæologist, Signor Dall'Osso, has discovered the remains of an early settlement, much earlier than the eighth century before Christ. I have visited only twice these interesting excavations, and I can only say there are remains of Etruscan graves and log huts with thatched roofs, and a round hearth filled with charcoal in the centre of the hard beaten clay floor. They have also found prehistoric pottery and flint implements of the neolithic age and many fragments, which bring the birthday of Rome to a date that will, as I say, shake a good deal our faith in ancient traditions. These discoveries have not yet been officially described, and therefore we must reserve our judgment until we have the materials at hand.

Another point on which I may say a few words is the one concerning the scheme of which Dr. Ashby has made mention, the archæological reconstruction of the centre of Rome, including the Capitol, the Monument to Victor Emanuel, and so on. The original scheme was much more modest; we wanted to create an archæological park comprising the Via Appia, the Baths of Caracalla and the Mediæval churches round them, and many monuments. The work has been done, a work to which I have devoted many years of my life, and it has succeeded beyond our expectation. But there is a new addition. The Italian Government have taken advantage of the political situation, and are asking that the Villa Mattei shall form part of the indemnity which the Germans must pay to Italy, and the villa and the Passeggiata, which are next to each other, will form one archæological park with which no other in the world can be compared, for beauty and interest. But this is not the end of it.

For the same archæological reason, it was decided to destroy the Palazza Caffarelli, which was the seat of a certain Embassy, which shall remain nameless. While we were building the foundations for the monument to Victor Emanuel and other buildings, we found that somebody else had been there before us, excavating long tunnels and going into the bowels of the earth; and while the Municipality of Rome owned but 7,500 square metres, our greedy neighbour had acquired 21,000, including the Temple of Jupiter Capitolinus. We are proud to state that such an inconvenient state of things is already a matter of the past. I have the honour of being President of this Committee for the reorgani-

sation of the archæological centres of the City, and I need not assure you that all our energies will be devoted to the accomplishment of this noble purpose. I know I shall have your unanimous consent in accepting my proposal of a vote of thanks to Dr. Ashby, the excellent Director of the British School at Rome.

Professor H. E. BUTLER: I was not aware that I was to have the pleasure of seconding this vote of thanks but nothing could possibly give me greater pleasure than doing so. It has been a great delight to hear my friend Dr. Ashby tell us of the more recent discoveries at Rome; I am backward in my knowledge of them, not having been in Rome for eleven years. It was therefore a great pleasure to me to hear of them, as, I am sure, it was to all of you.

There is one little mystery, which I should like Dr. Ashby to throw light upon. It is with regard to that corner of the Palatine which is occupied by the Church of S. Sebastiano, and which, I believe, has not been thoroughly sounded and excavated. Perhaps it is an unseemly thing to do to ask a question in seconding a vote of thanks, but it has always seemed to me rather curious that so many different views should have been expressed about this particular corner of the Palatine; without there being anything very definite to show. I excuse myself for asking this question by saying that Dr. Ashby has once more inflamed my curiosity on the point.

I most heartily second the vote of thanks; I can conceive no more interesting lecture, nor one on a more fascinating subject.

Professor BERESFORD PITE [F.]: I should like to support the vote of thanks to Dr. Ashby, and also to express the great pleasure it is to have Commendatore Lanciani with us again. I remember Dr. Ashby's former paper; I do not think we have had the pleasure of having him with us since 1910 at the Town Planning Congress. He then read an extraordinarily interesting and valuable paper, which is printed in the valuable volume of the Transactions of the Congress on the ancient walls of Rome. Commendatore Lanciani, a very old friend of any student of Rome, we have had the pleasure of having here before.

How interesting and alive a subject Rome is to us to-day! Rome, which had a doctrine of town planning, with a regular system of rectangular streets and a consistent outline, that it imposed upon its Empire from England in the North to the bounds of Syria in the East, along the Mediterranean Littoral, in Africa, Spain and Gaul—a stereotyped plan, based on a doctrine of town planning—was yet unable to apply its beneficent doctrine to its own capital. Rome utterly fails as an example of theoretical town planning, all theory having vanished under the pressure of circumstances, political and otherwise, in the same way that theories of town planners fade into fog and mist in



London. I have no doubt they had Commissions on Traffic in Rome, and made earnest endeavours to procure legislation, but the results indicate to us that the original crookedness of the highway between the valleys of the ancient cluster of villages, once crystalised, became sacred. The Via Sacra beneath the hills limited and hindered the application of the most potent town planning doctrines of the Empire. It was exactly the same at Athens. The city that had looked to Pythagoras for a scheme, was baulked in the effort of improvement by the abominable nuisance, the Acropolis, just as Rome was baulked by the Via Sacra. But genius was developed by these difficulties—created the extraordinary series of forums gradually becoming first rectangular, then dignified and beautiful around the crooked original forum Romanorum. Julius Cæsar, the hero of many wonders of military and political genius, was also a warm-hearted, generous contributor to the improvement of the heart of his miserably tangled Capital. Out of his own pocket he expropriated the property on which he laid out the first new forum, and the skill with which he created architectural space on an irregular site is manifest on the plan which has been shown to us this evening. The forums began to increase in magnificence and architectural dignity. The megalomania of these builders makes an architect's heart distend with admiration. The extravagance, the slave labour, the cruelty, the blackguardism which underlay it does not concern us at this moment; we cheer the swelling mass of architectural grandeur, but we find ourselves in the presence of this fact: that without evolving a single architectural form worth anything, they evolved an architectural system of planning, with rectangular porticoes, which to-day is the bread-and-butter of the competition designer. We live on these scraps which fall from the Roman architect's table; they are more useful to us than Greek. We cannot win a competition now with the pure Greek of the British Museum, but vulgar repetitions of the Roman fora do it effectively. And so the architectural circle revolves.

But there is much more to be noticed than this unending growth of scale which exploded itself in the scheme of the golden house of Nero. There is the extraordinary ignoring of all the civil conditions of life. Dr. Ashby will be able to assist us in this matter, but it really seems as if the Romans neglected the housing of their citizens, and concentrated themselves upon the provision of acre after acre of useless public spaces; it amounts to that by the time we get to the ultimate extent of the Forum of Trajan. And that is a very interesting and important symptom. Am I suggesting anything which is very wide of the mark when I say the population was forced into blocks of flats, just as we have been in our London, and that the congestion of the Metropolis of the world increased unduly? The people were even then being fed by dole and had learned to do

nothing; they lived on the glory of their Empire, and in crowded flats. There were interesting passages in the annals of Tacitus as to the fire in the days of Nero, which, he said, was not altogether to the detriment of the City, because new laws were made as to the laying-out of streets of a proper width, and regulations to avoid the difficulties from overhanging party walls. The Emperor himself volunteered to have the portico built, at the State expense, of any house of a citizen who would take up a site. That is very interesting if you realise that these porticoes were continuous, which masked whatever rubbish the owner of the site desired to put behind the Imperially-provided front. A very satisfactory way of providing a public architectural façade which will satisfy all criticism and leave entire liberty to the private owner behind.

There is much more which lies for our edification in the story which Dr. Ashby has touched upon to-night. History here repeats herself. We are in the possession of an Empire which has much the same political characteristics as that of Rome. Imposing peace upon a vast area and with similar difficulties in our own disreputable Capital, we find ourselves in the same architectural school, living on the same architectural pabulum, and scattering our unhappy products from Canberra to Canada.

Mr. E. P. WARREN [F.] : I would like to add my tribute to the charming lecture of Dr. Ashby, and to the waft of that eternal fascination of eternal Rome which he and Professor Lanciani have given us to-night. The more one is privileged to see of the freshly discovered antiquities of Rome, the more struck one is by the fact that their civilisation, as far as material needs went, had gone as far as, if not indeed a little further than, our own. There are very few things that we should have to give them to-day. The power of destruction by high explosives we have, electric light we have, and we have methods of locomotion they did not know; but as regards all the material pleasantnesses and well-being of life, I do not think the inhabitants of ancient Rome had much to learn from the inhabitants of modern London.

I was very much struck when, in 1913, I was privileged, with several other persons, to be conducted by Commendatore Boni to some excavations, then very recent, in which he showed us three houses superimposed one upon the other, and in one of them there were the remains of a hydraulic lift, in what we would call the engine room, with its bronze cylinders, posts and pistons. He also showed us all sorts of arrangements for heating, for the supply of hot water. And except in respect of light, I could not see that these Roman dwellings, dating from long before Christ, were much worse than the most modern and up-to-date flats in London.

I ask if Dr. Ashby can tell us as to the lighting of the streets of ancient Rome. I have never heard any authentic account of the manner in which the Roman streets

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were lighted at night. I have always thought they might have been lit as are remote towns and villages in France and Central Europe, by means of lanterns suspended by strings. Also I should like to ask whether the Roman vehicular traffic was such as to require direction. I surmise that it is not unlikely that there were Roman police on point duty. And one more question is as to the use of reinforced concrete. I have seen concrete reinforced with iron in the vault of the baths of Caracalla, and I ask if there are other instances of that to be found in Rome.

Mr. A. T. BOLTON [*F.*] (Curator of the Sir John Soane Museum) : There is one question I should like to ask Dr. Ashby, and that is in regard to the Exedra, of which he showed us a photograph. There were a number of these structures in Roman times, and I should like to ask whether he thinks they were a direct importation from the East, or did they, in his view, spring from anything previous in Italy? It has struck me that the origin of them would be found in the East, rather than in the West. We have had a remarkable paper by Professor Baldwin Brown, suggesting that the origins of Roman Imperial buildings should be sought in the vanished cities of Antioch and Alexandria. It is many years since I tried to get an idea of the Palatine Hill; the multiplication of ruins there is extraordinarily baffling; there is, for instance, that great block by Septimus Severus, underworks which leave an extraordinary impression on the memory. The great arches and vaults which you see there are only paralleled in this country by the understructures of the Adelphi. In this vast undertaking you can see something equivalent to the Roman work, carried out in bricks and mortar by Scotch and Irish workmen. The old question of whether the early vaults were ever erected on earth centres might seem to find some support in the curious underground chapel which he showed us; but it has always seemed difficult to believe they built a hill to construct the vault, and removed the earth afterwards. In this case, however, it was a good building proposition to put in the piers first, arch them over on the roughly cored surface of the earth and then take out what engineers call the "pudding." Such an underground method of building a chapel or shrine would lend itself very well to the obscure Oriental worships which were coming into Italy at the time of the early Empire. I would conclude by inviting Dr. Ashby to the Soane Museum, where the manuscripts which were brought by the Adams, and from them subsequently purchased by Sir John Soane, would be a special attraction, and if Dr. Ashby has time, we shall be pleased to see him there.

Mr. THEODORE FYFE [*F.*] : I also would like to add my thanks to the lecturer. And it is a very great pleasure to see Professor Lanciani here. We owe him a great debt of gratitude, not only for his address, but for

having stood shoulder to shoulder with Dr. Ashby and so showing the solidarity of scholarship.

It was very interesting to me that Dr. Ashby showed us that underground chapel, because the one first discovered in the Forum, that of Santa Maria Antiqua, was shown to me by Mr. Rushworth, in the year of the foundation of the School at Rome. It seems natural that we Britishers are thrilled by stories of ancient Rome. In his masterly statement on the glories of the Forum, and particularly of the Palatine, in itself a marvel, I think Dr. Ashby must have been under the influence of some echo of that greatness which we might achieve here, if we tried.

The PRESIDENT : The time is approaching when we must express our thanks to Dr. Ashby, and ask him to say a few words more in answer to questions which have been put to him.

But before asking him to do so, I would like to say a few words, certainly not by way of adding anything which is good to what has been put before us, because I am one of the humblest of scholars in regard to Rome. I have a great respect for the Romans, so great a respect that I do not think I should have dared to speak with the levity which Professor Pite did in regard to that ancient institution; but I thank him heartily for his speech, which has raised many questions for thought.

It has been a great event, also, to have had Commendatore Lanciani here to-night. His long and unselfish work in the great field of Roman archaeology is one that every student of antiquity must thank him for, and that he has come here to-night, for the second time in a fortnight, is a very great compliment to us. We want Dr. Ashby to understand, from all of us, not only that we have greatly profited by what he has told us and been deeply interested in what he has shown us, but also that we greatly appreciate the compliment paid our Institute in that we are the recipients of this new and fresh information which he has brought to us to-night.

Dr. ASHBY (in reply) : I thank you very much for the extraordinary kindness with which you have received my paper, and I thank my very old friend Professor Lanciani for the very kind words he spoke about me. This association has been to me a great pleasure in life, and long may it continue!

I will try and deal with the questions which have been put, but I fear I may omit something; if I do, I hope the questions I omit may be put again.

As to town planning in Rome itself, there was, as I said in my Paper at the Town Planning Congress in 1910, a complete absence in the Capital of the regular planning which is found in other cities of the Empire, but that, after all, is only a further example of the Roman genius. Some archaeologists have said that every rectangular camp is a Roman camp, and that others are not Roman. But the Roman was not a fool. If he had a pentagonal hill, he would not put a rect-

angular camp on it. The planning of Rome was fixed from very early times by the position of the hills and valleys and of the roads that led out of Rome. Rome very soon started a proper road system, and one of the reasons for the success of the Roman Empire was, that the Romans understood the importance of lines of communication; that side of military science they understood thoroughly. The roads by which they conquered first the neighbourhood, then Italy, then the whole world, were the very arteries through which their power flowed; and the result was that the points by which they left the City could not be changed, and the highways were most important things. There were thus fixed lines, issuing through certain gates, and naturally the hills and valleys have been very much obliterated. You will not force a natural scheme into a stereotyped line, and they had the sense not to try to do that, just as they showed sense in so many other things. In the case of the Roman religion they had the sense of adaptation; in the provinces they adapted it to the native gods.

Hardly any private houses are preserved in Rome itself, as a matter of fact. But there are plans of them preserved, and if we want to know what the Roman houses were like we have to go not to Pompeii, but to Ostia, and there we shall find a different state of things; for there was a great predominance of flats in Ostia. There is an entrance which will lead straight to one flat, there is another entrance which will lead to another flat upstairs, and so on, and that plan will be repeated in three or four storeys, one above the other, as shown by Mr. Lawrence, Mr. Pierce, and others. I want you to send us some more students like them, and like Mr. Bradshaw, too. When you see our students' drawings you will realise that no better work could be found in the British School at Rome than the collaboration with the Italians which is going on there at present in regard to the drawings of Ostia; some of the drawings you will see published in one of the Italian architectural reviews. You will see how modern the houses were, houses arranged around a courtyard, like the houses of the early Italian Renaissance. There are only two or three Pompeian houses in Ostia, and recent excavations in Pompeii

itself have shown they were not monotonous, but were very diversified. I think our traditional ideas about old Roman houses must undergo a radical transformation. We find a different scheme of planning in different houses.

With regard to the lighting of ancient Rome, it was by means of lanterns. There was exclusively foot traffic by day; carts were only allowed by night. Only privileged persons could drive by day, and that accounts for the narrowness of the streets though there was such a large population, something like 800,000. The ancients had very small bedrooms, as we see in Republican houses. They lived largely in the street, and they required somewhere to walk which was sheltered from the sun and the rain, and the Forum of Trajan was the last step towards a solution of their greatest traffic problem. Why a solution was not attempted earlier we do not know; probably others had shirked the problem.

With regard to the use of reinforced concrete, I know of no other instance of the use of metal than that in the Baths of Caracalla. Reinforced concrete was frequently used, but the ribs were formed of tiles, placed one above the other.

With regard to whether the exedra came from the East or from Syria, I cannot offer an opinion. But those who have read the late Commendatore Rivoira's "Lombard Architecture" will know he maintains that many features of Roman architecture were derived from the East, and some from the West. No doubt, as in most cases, the truth lies between the two. I think the tendency is more to a Roman origin than from the East. There is too much desire to attribute to the East what was really born in Rome.

With reference to the Basilica, I regard the use of earth for the setting of vaults as an exceptional feature, and only to be explained by the desire for secret worship to so construct these places that the construction should not be noticed. If there had been a big hole visible, people would have asked what it was for.

I hope I have dealt with all the points, and I would again say I hope you will send us more students of the type you have sent so far.



## A History of Architecture on the Comparative Method\*

By JOHN W. SIMPSON, PAST PRESIDENT R.I.B.A.

THESE has come to me a letter from the Editor of the JOURNAL asking for a short article reviewing this book. A "review"—I take it—implies critical examination, and the foundation of all criticism is judgment based, necessarily, upon appointed rules and precedents. That, at any rate, is the ancient, the classical method. Of late years there has sprung up a more irresponsible procedure. The reviewer is required to vacate the judgment seat, to abandon, as Symonds puts it, "the ferule of the archididasculus and assume the humbler pointing-rod of the showman." Sir Banister Fletcher's book, in its present form, has taken some twenty-five years to the making, beginning at a modest handbook at which examiners sniffed, grown now through successive editions and many reprints to a Standard Index; a compact reference to architectural books and buildings the world over. How should a conscientious critic treat such a work in a "short article"? It is not a treatise designed to maintain a theory, which the reviewer may briefly support or demolish by argument and sweet or bitter words. It purports to be—and is—history, written on modern lines, a collection of facts dispassionately presented for the reader's information. "Here," says the author, in effect, "is the fruit of a long harvesting methodically sorted; make what use you please of it. I give you my authorities. Do you disagree with my statements? Your quarrel is with them, not with me!" One cannot weigh and analyse so considerable a work, save at greater length than would be tolerable in this place; and a dissertation on the proper way to write architectural history would be jejune and profitless. A combination of the methods of criticism we have indicated would seem appropriate to our case.

To begin with, we have before us an octavo volume of xxxiv + 932 pp., including some 400 full-page plates and 28 maps. The book is well produced, the type sharp and legible, the photographs and geometrical drawings, some 3,500 in all, well and clearly rendered, and Messrs. Batsford are to be congratulated on the feat of limiting its thickness to rather less than two inches inclusive of its stout cloth covers. So much for its appearance.

The contents comprise a List of Illustrations and their authorities, grouped under the respective "styles"; and to this list the general index supplies the needful

cross-references, since illustrations and text are paged consecutively. The arrangement is commendable, but would be much improved were those items in the index of which illustrations are given marked with an asterisk. A short but sufficient glossary of technical terms ends the work, which is opened by a still shorter explanatory preface.

Having thus touched on its externals, we turn our pointing-rod to the essential nuclear matter of the book.

Nothing could be more orderly than its marshalling. Divided into two Parts, dealing respectively with what the author terms the "Historical" and the "Non-Historical" styles, these Parts are in turn subdivided into sections, each treating of a "style." Each of these sections is dealt with under five headings: (1) the six leading Influences which have shaped the "style"; (2) the Architectural character resulting therefrom; (3) descriptions of notable Examples of the "style"; (4) a Comparative Analysis, under seven sub-headings, of the elements which constitute its buildings; and (5) a short Bibliography of its special literature. To each section is prefixed a contemporary map of the country, or area, of whose architecture it treats. Such is the scheme followed by the author throughout both Parts of the book, to the end that "the influences, character, examples, and comparative features of each style can be contrasted with those of any other style." Adding only that the very limit of concision seems to have been attained, both in the prefatory summaries and the descriptive paragraphs of the various divisions, and that the proof-reader deserves a word of praise, we leave the showman's platform and assume the judicial ermine of the orthodox critic.

To the enquiry whether this addition to our already numerous Histories of Architecture serves any useful purpose, six successive editions and reprints, a steady annual sale of some hundreds of copies, are a sufficient answer. It is probably the permanent "best-seller" among books on architecture. The author well deserves his reward, for the labour involved must have been prodigious, and he has given us a book which—in its present form—is a most useful complement to an architect's library; a Standard Index, wherein he may find at once the essential facts about any building of note. We emphasise this view of Sir Banister Fletcher's work because therein lies—as it seems to us—its chief value. Its short, uncritical descriptions are a guide to the study in greater detail of bygone work. There is, we know, a school which decries such research as fatal to origin-

\**A History of Architecture on the Comparative Method*. 6th Edition. By Sir Banister Fletcher. London. 40s. B. T. Batsford.



ality. Sir Joshua Reynolds knew better ; " if we consult experience," said he, in his Sixth Discourse, " we shall find that it is by being conversant with the inventions of others that we learn to invent." For all, then, that the book is dedicated, modestly enough, to the use of " students, craftsmen, and amateurs," its main appeal will be, for the reasons we have given, to the practitioner. Indeed, the information it supplies is so extensive, so condensed, and so technical, as to make tough reading for the beginner. Students may, and doubtless do, avail themselves of its compactly ordered facts as satisfying morsels for their examiners ; but it is at least probable that the very method adopted in its compilation—the separation of " styles " into compartments—may tend to give them a false idea of the historical development of their art. For the author, not content with sorting out his " styles," must needs set them apart in groups, distinguishing " Historical " from " Non-Historical " ; and the latter group comprises Saracenic, Indian and Chinese architecture ! Does he forget how War and Commerce, those indefatigable seed-carriers, have been at work throughout all history mingling the race-germs, which under strange conditions have generated strange forms, bearing nevertheless traces of their origin ? Sir Banister's " Tree of Architecture " is more logical than his classification, for it shows all " styles," both historical and non-historical, springing from common root elements.

If we may be pardoned for repeating what we have said before in this JOURNAL, " there are no stylistic divisions ; the periods melt one into another ; their apparent border lines disappear when examined at near hand, and it is only by contrasting extremes, at wide intervals of time, that paper classifications are constructed. Architecture must be looked on as a whole, a majestic movement of evolution through the ages. Ramses and Ictinos, William of Wykeham and Mansart, all dealt with the same eternal elements ; each in his own way, moved thereto by the conditions in which he lived and worked."

But, when all is said, our criticism is directed rather to the labels than to the contents to which they invite attention. Had the two " Parts " been distinguished as " Western " and " Eastern " architecture, and " Periods " substituted for " Styles," there would be but little logical exception to be taken on the score of terminology. Considered as a Dictionary of architecture, the book is worthy of all praise. Sir Banister Fletcher has invented a system whereby an immense mass of constantly needed material is ingeniously tabulated for easy reference ; and he has developed his system with mathematical precision. Original in conception and conscientious in detail, this is the best book of the kind that has yet been written.

## Architectural Acoustics\*

### THE PHYSICAL RELATIONSHIP BETWEEN BUILDING AND MUSIC

By HOPE BAGENAL [A.]

The publication in book form of the late Professor Sabine's Harvard experiments on applied acoustics, together with the plans and calculations of the buildings remedied and designed as a result of his labours, makes it possible to review positively a subject held to be obscure.

It is rare than any branch of accurate knowledge owes so much to a single mind as architectural acoustics owes to Sabine. The growth of the subject in its modern aspect is worth a brief survey. Previous to Sabine the underlying principles have been recorded by several scientists : by Wren in his *Parentalia* ; by Professor Tyndall before a select committee of the House of Commons in 1867 ; by Joseph Henry at the Smithsonian Institute in 1856 ; by Lord Rayleigh in vol. ii. of his *Theory of Sound* ; and by Guadet in his *Elements et Theory d'Architecture*. It is reasonable to inquire why our considerable knowledge of pure acoustics, gained in the last century, had no equivalent effect on the designing of auditoria. The reason, in its simplest form, is that the general body of acousticians were content in their laboratory experiments to assume open air conditions and to

ignore the physical effect of the enclosing walls and ceiling of their laboratory. Sabine showed that acoustics, as an exact science, comes under a different category when we consider not only the experiments themselves but also the hall or laboratory in which the experiments are carried out. In a lecture at the Sorbonne, delivered by him in 1917 before the Société Française de Physique, not included for some reason in the volume under review, occurs this illuminating sentence : " Experiments made in a laboratory are seriously affected by the surrounding conditions, by the fact that the walls reflect 94 per cent. of the sound if they are wood, 96 per cent. if they are plaster and more than 97 per cent. if they are (painted) brick. Consequently, experiments designed to measure sound under such conditions are equivalent to attempts at measuring light in a laboratory where the platform, the walls, the floor and even the tables are brilliant mirrors."

It was in 1895 that Sabine began to experiment upon a notorious lecture theatre, known as the Fogg Art Museum Lecture Room. This auditorium when empty had a reverberation of  $5\frac{1}{2}$  seconds—that is to say, a syllable uttered in an ordinary tone of voice lasted for  $5\frac{1}{2}$  seconds before it died away, during which time even a slow speaker would have uttered the succeeding twelve or fifteen

\* *Collected Papers on Acoustics*. By Wallace Clement Sabine. Harvard Univ. Press. London : Humphrey Milford. 1922. Price 17s.

syllables. The experiments carried out in this room lead to the first statement of Sabine's *Law of Reverberation* and a whole new series of experiments was presently undertaken, having as its object the acoustic analysis of all the ordinary building, lining, and upholstering materials for the whole range of the musical scale. The experiments were precise, tedious and expensive; they lasted for a long series of years and were often of necessity conducted by night, when city noises were at their minimum. They called for a peculiar mixture of skill and pertinacity in the investigator. The results are a great tribute not only to the scientific power of Sabine himself but to the Harvard Faculty of Applied Science, which considered the time and expense worth while in the interests of technology. An opportunity of testing the preliminary data occurred as early as 1898, when McKim was instructed to prepare designs for the new Boston Concert Room. An interesting collaboration between architect and physicist followed. Sabine saw at once that the success of the project must depend largely on the accuracy of musical taste in the matter of orchestral requirements, and set about investigating it. He accompanied the Boston Symphony Orchestra to a number of concert rooms, and ascertained the reverberation of each. The Leipzig Gewandhaus and the Old Boston Concert Room were finally selected as models, and their acoustic conditions, involving a reverberation of 2.3 seconds, were reproduced in McKim's new building, designed to seat a much larger audience, and successfully carried out.

Four years later, in 1902, another series of investigations on this cardinal question of musical requirements were conducted by Sabine, in which five distinguished instructors of music were asked to note down their opinions of five different rooms suitable for chamber music. The results showed that for this class of auditorium a reverberation of 1.1 seconds was generally acknowledged as satisfactory.

In 1911 Professor Jäger, in Austria, corroborated and developed Sabine's theory in a Paper entitled *Zur Theorie des Nachhalls*, contributed to the Akademie der Wissenschaften in Wien. A laboratory for the study of acoustics of buildings was opened the following year in Dresden. Contributions to the various problems connected with the Harvard theory were also made by Franklin, Watson, C. M. Swan and other physicists in America and by M. Marage in Paris. In 1912 Albert Kahn built a large auditorium at Michigan University to seat 5,000, to a pre-arranged acoustic programme, with complete success. Soon afterwards, Sabine was associated with Messrs. Carrère and Hastings in the difficult acoustic problems involved in the treatment of the New Theatre, New York. This led him to give special attention to theatres, with results embodied in the interesting chapter *Theatre Acoustics*. During the war Sabine came to England. In 1917 he was admitted to the floor of the House of Commons during a debate. The R.I.B.A. JOURNAL published in that year, by special permission, his paper on *Architectural Acoustics* read before the Franklin Institute, and embodied in the book under review. In Paris he lectured at the Sorbonne and before the École des Beaux Arts, and was consulted by the Bureau des Inventions. When America entered the

war he was employed at Washington as well as in the Science Schools at Harvard, and according to his friend and colleague, Mr. E. H. Hall, embarked upon "a course of toil that must end his life." He died shortly after the close of hostilities. The fine acoustic laboratory specially built for him at Geneva, Illinois, was apparently scarcely used before his death, and is now under the direction of his son, Professor Paul Sabine, who is continuing his work.

Now Sabine's "discovery" that hard wall surfaces in acoustics are equivalent to brilliant mirrors in optics has a direct bearing upon design. Obviously "brilliant mirrors," that is to say reflecting surfaces, are required near the source of sound, and should not be placed in haphazard positions; their effect should be part of a general scheme in which diffusing, resonant and absorbing surfaces also would play their proper part. In all auditoria, of whatever kind, the surfaces of walls, fittings, upholstery and audience fall under one of those categories—are either reflecting, diffusing, absorbing or resonant. The general phenomenon, reverberation (the time taken for a sound to die away in a room) is an index of the total acoustic result of all the surfaces in the room in relation to its volume, and for that reason is so important a measurement. Sabine's law in its simplest form is: (i) That reverberation varies directly with volume—that is to say, the larger the room the longer the reverberation, and (ii) that reverberation varies inversely with the amount of sound-absorbing material in the room—that is to say, that for a given volume the more absorbents introduced the shorter the reverberation. For a true comparison of one room with another by this law a standard loudness of the sound emitted had to be decided upon, and also, since reverberation was found to vary with pitch, experiments had to be made to cover the musical scale. The tables of the absorbing-power-coefficients for the ordinary building and upholstering materials are given for a standard loudness of sound and for every octave from  $C_1$  to  $C_7$  (see page 78 *et seq.*, *Variation in Reverberation with Variation in Pitch*). It will be seen from the curves that generally the absorption is greater for the upper registers. This has an important bearing on the designing of concert rooms and opera houses. A note sounded on any instrument consists, as Helmholtz has shown, of a fundamental tone giving its pitch, and in addition a series of overtones giving its quality or *timbre*. Instruments therefore possessed of powerful and characteristic overtones will be affected by the presence in a concert room of certain absorbents. Their tone will be modified. Brass instruments and men's voices are of this kind. On the other hand, purer instruments such as 'cellos, flutes, and boys' voices tend, by the same means, to be reduced in loudness but not modified in tone. This explains the observed fact that solo voices well known in the opera house or concert room often appear strangely sharp and harsh when heard in a cathedral, and also that 'cellos and flutes sound well in a large bare hall where their simpler tones have full play.

With such facts before us it requires no special knowledge to recognise that reverberation or the prolonging of a sound after its source has ceased is an energy condition of the whole room, and when measured in seconds

will 'give an index of the loudness, the distinctness and the tone of musical sounds. For choral and orchestral music the slight overlapping of sounds produced by a reverberation of 2 seconds or more enhances the tone; but too long a reverberation will spoil the strict time element in the music. Hence the value to architects of the standard reverberations ascertained by Sabine, namely, 2.3 seconds for a large orchestra hall and 1.1 seconds for a small hall for chamber music. The speaking voice is, of course, only a special case where the sound is of pitch  $C_4$  to  $C_5$  and of a moderate loudness. For the speaking voice, therefore, the reverberation should be as short as possible, compatible with adequate loudness in the rear seats.

If, therefore, a programme of requirements for a large auditorium were to be drawn up, a suitable reverberation could be specified, and the architect would then allow for the necessary absorbing surfaces to ensure it, exactly as he would allow for a good modern system of ventilation. He would then find that he could economise absorbing material by a suitable relation of surfaces, and also by reducing the volume of the hall to a reasonable minimum. This is in fact the tendency in modern American theatre design.

But we cannot limit the implications of Sabine's teaching to modern technology; it has also an interesting historical bearing. The relationship of building to music exists to-day and has always existed; the auditorium has always been a powerful instrument to the music produced within it. Perhaps the most interesting chapter in the book is that on the origin of the musical scale. Here Sabine examines, in the light of his own research, Helmholtz's famous theory of the harmonic origin of intervals, the theory that "melody is resolved harmony." In the monumental work, *Sensations of Tone*, the compound nature of a musical tone was first analysed by Helmholtz and shown to consist not of a single pure tone but of a fundamental and a series of upper partials or overtones, all harmonically related. This led to the explanation of *consonances* as due to the existence in tones of different pitch of partials of the same pitch. According to Helmholtz, the notes of the musical scale have come to be arranged at such interval distances as will provide the largest number of consonances when they are heard in harmony; the consonances depending on the identity of the overtones of the notes heard coincidentally.

But this theory, which holds for modern chordal music, and to a less obvious degree for mediæval polyphonic music, appeared to Helmholtz to break down when applied to the unison music of the ancients, where harmony in the sense of chords, or coincident tones of different pitch, did not exist. To overcome this discrepancy, Helmholtz constructed his theory of melody as rhythm, based on a supposed instinctive knowledge on the part of early musicians of the compound nature of tones. But this, as Sabine points out, assumes the knowledge of the accomplished musical student. "This power of analysis goes rather with supreme skill than with the early gropings of an art." It may be urged that Aristoxenus was a theorist sufficiently accomplished; but the scales he analysed already existed, and in forms so developed as to imply a long ancestry. There is no reason to suppose that classi-

cal music was not part of the general Mediterranean culture, having its roots in Egypt. Sabine disputes that any such subsidiary theory is necessary. The *actual experience* of harmony was always possible in primitive music where a melody was sung in a building of brick or stone or even in a cave giving a sufficient reverberation. In reverberation we have the contribution of an energy condition giving the required time element and the required tone element for simple harmonies. The time element causes the overlapping of successive notes, and the tone element, as we have noticed in the modern case, renders active all those partials prevalent in the man's voice, upon the relations of which Helmholtz constructs the scale. We must look, then, for the origin of the musical scale in the cellae of Egyptian temples and from the palace halls of early stone-dwelling peoples. We have evidence of the constructive influence of the auditorium to guide us in the case of mediæval music. The Gregorian chants developed in a definite relation to the reciting or intoning note of the priest—a "note" which was also really a tonality, caused by the long reverberation of the mediæval church. Within this tonality it was easy and natural to sing melody in tune; that is consonantly. No one who has experienced the impulse to sing in an empty room, and detected within himself an almost physical response to tone under those conditions, would doubt that wherever those conditions existed they must have influenced experiments in music.

Sabine's example of the musical case of the African negro transplanted to America is less convincing than others that could be drawn from ethnology. In certain primitive peoples the anomaly is found of two musics—an open air rhythm and beating of large drums distinguishable at great distances, highly complicated and developed and obviously impossible of performance indoors, and, parallel to that but without any obvious cultural connection, a musical scale with airs not unlike the European which, though now always heard out of doors, might well on a theory of migrations have been derived from some previous contact with a stone-dwelling people.

In conclusion, we would pay every tribute to the content of this single volume, into which has been resolved the labours of an exceptionally acute and sensitive mind, capable of taking a wider view than the specialist's. But it is a pity that no index has been provided, that references are often lacking, and that the book has not apparently been edited by a student of the special subject and its many problems.

#### INTERNATIONAL HOUSING CONGRESS AT ROME, SEPTEMBER 1922.

Mr. G. Topham Forrest has been appointed by the Council delegate of the Institute at the Congress.

MR. W. E. WATSON.

Mr. W. E. Watson [F.] of Mitre Court Chambers, Temple, has been called to the Bar from Gray's Inn.

## Further Notes on the Composition of Ancient Mortars; and Mortar and Plaster from St. Paul's Cathedral

By W. J. DIBDIN, F.I.C., F.C.S., etc.

**B**Y the kind co-operation of Mr. W. D. Caröe, F.R.I.B.A., who supplied me with further samples of ancient mortar collected by him, I am enabled to submit to the Institute the results of their examination, in addition to those given in my report to the Science Committee of the Institute in 1911.

Also, by the kind permission of Mr. Mervyn Macartney, F.R.I.B.A., I am enabled to submit the results of the analysis of twenty-five samples of mortar and plaster from various parts of the structure of St. Paul's Cathedral, which were collected in connection with the inquiry as to the safety of the building.

The detailed results of these two series are set out in the accompanying tables, which present the respective data in a convenient form for reference and comparison in a manner similar to that adopted in the report to the Science Committee: see table opposite page 28 of that report.

### ANCIENT MORTARS.

In series No. 1, the seventh (? ninth) century mortar from Monkwearmouth (Durham) church is a very fine sample of hard mortar having a crushing strength of no less than 323 lb. per cubic inch, although the proportion of unslaked lime to sand and grit is as high as 1 to 0.3. The soluble silica, viz., 0.98 per cent., precludes the presence of a highly hydraulic lime, trass, or pozzuolana. The high proportion of lime is, however, largely accounted for by the presence of unburnt chalk with fossils, indicating that natural chalk was employed to help out the aggregate, a practice which was not at all unusual. A similar case is that of the sample from St. Paul's Cathedral, given in column 23, Series 2, "Mortar from the Core of the Main Pier A, about 30 feet from Nave Floor." The seventh century mortar contained as much as 6.9 per cent. of clay, etc., in the matters insoluble in hydrochloric acid. Of this quantity about one half was of an organic nature.

In column No. 2, Series No. 1, is given a sample of mortar from Westminster Abbey, being a portion of the original stonework of the first part of Henry III original mortar, early thirteenth century. This contained no earthy matter, and the sand was fine in character, all passing an eighth inch mesh. The proportions, by volume, of unslaked lime to sand, etc., being 1 to 0.53. It was a hard, white mortar.

In column 3 of the same series a sample is given from a church at Darenth, said to be Saxon. Query, latter part of the eleventh century. This was a hard, whitish

mortar with water-worn black flints, and contained 2.88 per cent. of ferruginous clay, equal to 4.32 per cent. of the sand and grit. The proportion of lime to sand, etc., was 1 to 1.4. It contained a trace of copper.

In the next column is given a sample from the window of the same church, which is either Saxon or first ten years after the Conquest. This contained no earthy matter, and was very friable. The sand was very fine, all passing a thirty-second inch mesh. The proportion of lime to sand, etc., was as high as 1 to 0.5 by volume.

In column 6 an interesting sample is given of Roman mortar from the aqueduct at Frejus—the Forum Julii of the Romans. It is a genuine piece of the original Roman construction, collected by Mr. Caröe from the centre of the wall. The date of construction is uncertain, but the city was an important one in the time of the Emperor Augustus, so that it must be considerably more than two thousand years old. The mortar was very hard, and firmly adhered to fragments of granite. The crushing strength was 163 lb. per cubic inch. A noticeable feature was that the "earthy matter" in the matters insoluble in dilute hydrochloric acid consisted of slightly ferruginous clay and silica, doubtless derived from the decomposition of granite. The sand and grit consisted of clean quartz sand, with many fragments of mica, hornblende and degraded granite fragments. The proportion of unslaked lime to sand and grit was 1 to 3.6.

The above results of the examination of the various samples are in agreement with those of the examinations given in the report to the Science Committee, particularly with regard to the absence of abnormal quantities of soluble silica, the presence of small quantities of unburnt earthy matter such as clay, etc., and in many instances the large proportion of matrix to aggregate.

### ST. PAUL'S CATHEDRAL.

The samples from St. Paul's Cathedral may be divided into seven divisions, viz.:

A.—Plaster of paris or gypsum: see columns 1, 7, 8, 15, 16, 18, 19, and 20.

B.—Mixed plaster of paris and lime mortars, columns 21 and 22.

C.—Normal mortar with high proportions of lime, columns 2, 3, 5, 6, 10, 13.

D.—Fat lime mortars, columns 4, 17.







Column								1	2	3	4
Description								Used in Setting Stones	B <sub>1</sub> From interior of Crypt Piers filling interstices between the rubble of which the Piers are built.	B <sub>2</sub> Taken from surface of solid piece of Limestone in Concrete	A <sub>2</sub> Cement Pointing
Insoluble in dilute HCl	..	..	Per cent.					2.59	35.90	27.10	1.58
Soluble Silica	..	..	..	..	..	..	..	0.30	2.95	0.70	0.20
Oxide of Iron and Alumina	..	..	..	..	..	..	..	2.30	2.25	1.15	0.30
Lime (CaO)	..	..	..	..	..	..	..	28.60	31.35	36.25	51.60
Magnesia	..	..	..	..	..	..	..	Trace	Trace	Trace	Trace
Carbonic Acid (CO <sub>2</sub> )	..	..	..	..	..	..	..	3.80	16.20	22.80	31.00
Sulphuric Acid (SO <sub>3</sub> )	..	..	..	..	..	..	..	42.10	Trace	Heavy Trace	1.23
Water of Hydration	..	..	..	..	..	..	..	19.50	10.40	11.20	11.50
Alkalies, moisture and loss	..	..	..	..	..	..	..	0.81	0.95	0.80	2.59
								100.00	100.00	100.00	100.00
Earthy Matter	..	..	..	..	..	..	..	—	—	—	0.69
Description of Earthy Matter	..	..	..	..	..	..	..	—	Little Ferruginous Clay	Little Ferruginous Clay	—
Nature of Sand or Grit	..	..	..	..	..	..	..	—	Grey Medium Sand	Grey Medium Sand	Very fine Grey
Grading of Washed Sand, etc.	..	..	..	..	..	..	..	—	—	—	—
Retained on $\frac{1}{8}$ inch mesh	..	..	Per cent.					—	—	—	—
" $\frac{1}{16}$ "	..	..	..	..	..	..	..	—	—	—	—
" $\frac{1}{32}$ "	..	..	..	..	..	..	..	—	—	—	—
Passed $\frac{1}{32}$ "	..	..	..	..	..	..	..	—	—	—	100.0
											100.0
Percentage of Clay, etc., in Grit	..	..	..	..	..	..	..	—	Heavy Traces	Heavy Traces	—
Lime corrected to Commercial Lime of 80 per cent.	..	..	..	..	..	..	..	—	39.2	45.31	64.5
CaO	..	..	..	..	..	..	..	—			
Volume of Unslaked Lime (i.e., Commercial Lime × 2½) to Sand and Grit	..	..	..	..	..	..	..	—	1 : 0.36 Hard Mortar	1 : 0.24 Hard Mortar	—
Physical Character of Sample	..	..	..	..	..	..	..	Very hard, consisting of Plaster of Paris in three layers.			All Carbonate of Lime Limestone
Reaction	..	..	..	..	..	..	..	Neutral	Alkaline Present	Alkaline Present	Alkaline Present
Free Lime	..	..	..	..	..	..	..	—			
Crushing Strength per cubic inch	..	..	..	..	..	..	..	—	—	—	—
								A	C	C	D

# THE COM

## Results of Ex

5	6	7	8	9	10
B <sub>3</sub> Mortar from a position deeper in the Core of the Crypt Pier about 3 feet from the surface	C From the back of the stone facing of the S.W. Pier of the S. Transept. One of the Piers carrying the Dome. Mortar in which the stones are set and backed	B <sub>3</sub> Lime from Pier "A" in Crypt	Mortar cut from face of lead-filled joint in Arch of S.W. $\frac{1}{2}$ Dome.	Piece of Stone from over S.W. Transept Window	Mortar taken from uppermost Octagon Gallery level of N.E. Bastion, East Door jamb of door to Gallery over N. Choir Aisle. Original Mortar
31'3 3'5 2'0 30'0 Trace 12'6 0'95 17'1 2'55 <u>100'00</u>	33'30 2'15 1'50 35'29 0'07 16'20 0'69 10'80 — <u>100'00</u>	2'50 0'50 0'60 30'27 Trace Trace 42'83 23'30 — <u>100'00</u>	1'70 0'60 Trace 31'85 Trace None 45'50 19'80 0'55 <u>100'00</u>	4'30 0'50 0'60 46'68 Trace 34'40 4'12 7'20 2'20 <u>100'00</u>	27'40 0'25 0'85 35'00 Trace 26'93 1'03 7'50 1'04 <u>100'00</u>
3'3 Ferruginous	2'0 Clean Ferruginous	Trace —	Trace —	0'80 Black and frothy	0'20 Ferruginous, Gritty
Fine Grey	Fine, clean Grey	Fine Grey Sand	Fine Grey Sand	Fine Grey	Fine Grey
— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>
10'5 37'5	6'0 44'1	— —	— —	19'0 —	0'80 43'75
1 : 0'75 White, very hard	1 : 0'28 White, very hard	— Like very hard, dry "Putty," soft surface. All Gypsum	— Very hard dry Plaster. All Gypsum	— Limestone	1 : 0'25 Very hard White
Alkaline Quantity present	Strongly Alkaline Quantity present	Neutral None	Neutral None	Slightly Alkaline Trace	Alkaline None
127 lbs. C	111 lbs. C	111 lbs. A	490 lbs. A	— F	— C





# COMPOSITION OF ANCIENT MORTARS

Results of Examination of Samples of Mortar from St. Paul's Cathedral

## SERIES 2

10	11	12	13	14	15	16
Mortar taken from topmost Octagon gallery level of N.E. Bastion, East jamb of door Gallery over Choir Aisle. Original Mortar	Pier "A," South Transept, from E. side of Pier, on surface	Mortar taken from West side of South Transept over Vault where wall has dropped and been wedged up with this piece	Mortar from Paving Brick from topmost Octagon N.E. Bastion (Wren's Original)	Specimen of Caen Stone (?) from Octagon room, N.E. Bastion	Stopping in crack from South Buttress + Dome	Wren's Original Mortar from under West Window of South Transept
27'40 0'25 0'85 35'00 Trace 26'93 1'03 7'50 1'04 <u>100'00</u>	17'80 3'60 15'65 27'50 Trace 18'24 3'32 12'76 1'13 <u>100'00</u>	34'00 0'60 0'75 33'00 Trace 24'60 1'61 5'44 <u>100'00</u>	43'00 1'20 1'10 27'90 Trace 21'30 1'10 3'40 <u>100'00</u>	5'00 0'30 0'20 51'50 Trace 39'80 0'86 2'00 0'34 <u>100'00</u>	0'80 1'20 0'30 29'70 Trace 42'00 24'40 1'60 <u>100'00</u>	6'50 0'20 0'50 31'00 Trace 3'80 37'20 20'40 0'40 <u>100'00</u>
0'20 Fraginuous, Gritty	7'20 Very Ferruginous	—	—	—	—	—
Fine Grey	Fine Grey Ferruginous	Fine Grey	Fine White	—	Fine Ferruginous	Fine Grey
— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>	— — — — — <u>100'0</u> <u>100'0</u>
0'80 43'75	40'5 34'4	— 41'25	— 34'87	— All Carbonate of Lime	—	—
1 : 0'25 Very hard White	1 : 0'22 Very hard Cement nature	1 : 0'33 Hard White, with shells which were excluded in the above	1 : 0'5 Very hard White	— Very hard with metal- lic ring	— Very hard White smooth surface. Gypsum	— White, very hard, me- tallc ring. Gypsum, with 6½ p.c. of sand
Alkaline None	Slightly Alkaline None	Faintly Alkaline None	Strongly Alkaline None	Alkaline None	Distinctly Alkaline Trace	Faintly Alkaline None
—	—	—	458 lbs.	—	—	—
C	G	E	C	F	A	A

al  
ader  
of  
pt

d, me-  
psum,  
sand

line





16	17	18	19	20	
Wren's Original Mortar from under West Window of South Transept	Filling in Mortar West side of South Transept, under Large Window		S.W. Quarter Dome. Mortar taken from flaunching of top Course under Quarter Gallery	Mortar from added drafted Stone at angle under Quarter Gallery over Pier B	Mort inside
	99a Stone	99b Plaster			
6'50 0'20 0'50 31'00 Trace 3'80 37'20 20'40 0'40 <u>100'00</u>	1'20 0'10 1'70 51'00 Trace 38'30 2'57 4'60 0'53 <u>100'00</u>	3'65 1'85 0'90 31'30 Trace 1'70 41'60 19'00 — <u>100'00</u>	1'82 Trace Trace 31'60 0'22 0'00 44'86 20'60 0'90 <u>100'00</u>	11'70 0'30 Trace 27'40 0'00 0'00 39'16 20'40 1'04 <u>100'00</u>	
— —	Nil —	Trace —	— —	— —	
Fine Grey	Fine Grey	Fine Grey	Fine Grey	Fine Grey	Clean little matter
— — — — <u>100'0</u> <u>100'0</u>	— — — — <u>100'0</u> <u>100'0</u>	— — — — <u>100'0</u> <u>100'0</u>	— — — — <u>100'0</u> <u>100'0</u>	— — — — <u>100'0</u> <u>100'0</u>	
— —	— —	— —	— —	— —	
White, very hard, me- tallic ring. Gypsum, with 6½ p.c. of sand	Grey stone with soft Limestone	Plaster adhering. Gypsum	Very hard white plas- ter in thin layers. Gypsum	Very hard white plaster Gypsum with fine sand	In this ¼ in. th Morta Gypsu
Faintly Alkaline None	— —	— —	Slightly Alkaline None	Neutral None	Fair
— A	— D	— A	— A	— A	

21	22	23	24	25	26
Mortar taken from inside of Brick Cone	Mortar taken from wide joint under impost of Crypt Pier, where iron wedges used. Pier D	Mortar taken from the Core of Main Pier A, about 30 ft. from Nave floor	Experiment as to Water absorption power	Two samples of Mortar squeezed out from the joints during the settling of the building sent for crushing tests	
				From pockets in Dome Buttresses	From pockets between Nos. 1 and 2 Buttresses
				Blocks about 2 in.	by 2 in. by 2 in.
28.46	12.28	39.22	Weight of mortar taken, 10.665 grammes	Wetted. Softened gradually to 180 lbs.	215, 125, 100, 200 Av. 160 lbs.
0.40	0.20	1.90			
1.30	0.40	0.90	Weight of water absorbed, 3.382 grammes	Dry. 130 to 300 lbs. when spalling commenced	100, 180, 280, 250 Av. 202 lbs.
35.70	33.88	34.00			
Trace	Trace	Trace	∴ 100 lbs. of mortar will absorb		
22.00	12.42	10.72			
3.74	25.05	0.38			
8.40	15.08	11.08			
0.00	0.69	1.80			
100.00	100.00	100.00	31.71 lbs. of water		
Trace	Trace	Trace	—	—	—
—	—	—	—	—	—
Clean Grey with a little Ferruginous matter	Clean Grey Sand	Grey with some ferruginous matter	—	Weight of water absorbed,	26.4 per cent.
—	—	—	—	The crushing tests of the wet mortar a rapid giving way or rearrangement of the disintegrated mass indicated in the case of materials, although still resisted considerable pressure.	indicated in the case of materials, although still resisted considerable pressure.
—	—	—	—		
—	—	—	—		
—	—	—	—		
—	—	—	—		
100.0	100.0	Nearly all 100.0	—		
100.0	100.0	100.0	—		
—	—	—	—	—	—
44.62	This is a mixture of Gypsum and Lime mortar in almost equal proportions and very hard	42.5	—	—	—
1 : 0.26	—	1 : 0.41	—	—	—
In thin pieces ¼ in. to ½ in. thick, hard Lime Mortar with 6 p.c. Gypsum	Mortar proportions = 1 : 0.24	Fairly hard, contains unburnt chalk and fragments of charred wood	—	Very hard, almost like Cement Mortar	Very hard White
Faintly Alkaline Trace	Faintly Alkaline 0.5 p.c. Free Lime	Strongly Alkaline 20 p.c. Free Lime now present	—	—	—
—	—	180 lbs.	—	None	None
—	—	—	—	—	—
B	B	E			

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E.—Mortar mixed with chalk as aggregate, columns 12 and 23 (the latter containing fragments of charred wood).

F.—Limestone, column 9.

G.—Roman, or similar cement, column 11.

In columns 24, 25, and 26 are given some determinations of the water absorption power and crushing strength of mortar squeezed out from the joints during the settling of the building:—

A.—Plaster of paris was used in setting stones, column 1; in the pier "A" in the crypt, column 7; on the face of the lead-filled joint in arch of south-west P/4 dome, column 8; for stopping the crack from south buttress dome, column 15; in Wren's original mortar from under west window of south transept, column 16; filling in mortar west side of south transept, under large window, column 18; for flaunching of top course under quarter gallery, south-west quarter dome, column 19; for added draft stone at angle under quarter gallery over pier B, column 20.

B.—Two examples are given of mixed plaster of paris and lime mortar—viz., for inside of brick core, column 21, and in joint under impost of crypt piers, where iron wedges were used, pier D, column 22.

C.—Lime mortars were found in the interior of the crypt piers, column 2; in the surface of limestone in concrete, column 3; in the core of the crypt pier, column 5; in the back of the stone facing of the south-west pier of the south transept, column 6; in the original mortar on the east door jamb of door to gallery over north choir aisle, column 10; for the mortar from paving brick from topmost octagon north-east bastion (Wren's original), column 13.

D.—Fat lime mortar was used for "cement pointing," column 4; and filling mortar, west side of south transept, under large window, column 17.

E.—Mortar, with unburnt chalk as aggregate, was taken from west side of south transept over vault, where wall has dropped and been wedged up with this mortar, column 12; and for the core of main pier A about 30 feet from nave floor, column 23.

F.—Two samples of limestone (? Caen) were examined, one from south-west transept window, column 9; and a second from octagon room, north-east bastion, column 14.

G.—Only one sample in any way resembling cement was submitted for examination—viz., from pier A south transept, from east side of pier on surface, column 11.

From the data thus available it appears that when lime mortar (C) was used it generally contained ferruginous clay, in one case, column 5, as much as 10.5 per cent. of the sand, etc., and that the proportion of lime to aggregate was very high, the modern "1 to 3" being roughly reversed, or "3 to 1." The soluble silica factor was very variable, ranging from 0.25 to 3.5 per cent.

In columns 24, 25, and 26, series 2, are given the results of some physical tests of the mortar. An ex-

periment on the absorption power showed that an air-dried sample absorbed 31.71 per cent. of its weight of water. The crushing tests of two samples of mortar squeezed out from the joints during the settling of the building showed that when wetted one sample "softened" gradually to 180 lb. per cubic inch by the "giving way" or rearrangement of the particle.

The second wetted sample broke at 160 lb. per cubic in. When tested in a dry condition the mortar broke at from 130 to 300 lb., when spalling commenced. A second sample broke at an average of 202 lb. per cubic in.

## The Danger to St. Paul's

### R.I.B.A. FUND

The President of the Royal Institute has received the following letter from Canon S. A. Alexander, Treasurer of St. Paul's Cathedral:—

"I am writing on behalf of the Dean and Chapter of St. Paul's to ask your attention to the papers enclosed with reference to the new Appeal for the Preservation of the Cathedral. The Institute sent us, very kindly, a hundred guineas in 1914, and we hoped that it might be possible for you to give us some further support at this critical time."

The Dean and Chapter of St. Paul's are asking for the sum of £100,000 for the absolutely essential work of repair on the piers and arches supporting the dome of the Cathedral, which have been declared insecure by the Special Commission of Architects and Engineers\* appointed last autumn to examine the condition of the building. The cost of the work on the South Transept, now almost completed, has been defrayed by a fund raised by public subscription in 1914. This is now almost exhausted, and a further £100,000 is necessary to enable the repair of the defects recently disclosed by the Commission's report to be carried out.

The Council of the Royal Institute have decided to establish a R.I.B.A. Fund and to appeal to members for subscriptions. The Allied Societies of the R.I.B.A. in the Provinces have been invited to open subscription lists in their own districts and to forward collectively to the R.I.B.A. the amounts so received. The Council itself appeals especially to London architects to send subscriptions, however small, to the Fund, so that a worthy contribution may be made by the Architectural Profession towards safeguarding the strength and permanence of the masterpiece created by the daring genius of Wren. There is no more fitting or sincere method in which architects can commemorate the approaching bicentenary of the death of one of the greatest of their number.

The list will be closed at an early date, and members are therefore invited to forward their subscriptions to the Secretary R.I.B.A. as soon as possible. A list of subscribers will be published in the R.I.B.A. JOURNAL.

\* The Commission consists of Sir Aston Webb, P.R.A. (Chairman), Mr. G. W. Humphreys, C.B.E., Chief Engineer of the L.C.C., Mr. Basil Mott, C.B., Consulting Engineer, Mr. E. F. C. Trench, C.B.E., Chief Engineer to the L. & N.W. Railway, and Mr. Mervyn Macartney.

# THE COMPOSITION OF ANCIENT MORTARS

Results of Examination of Further Samples of Ancient Mortar  
collected by W. D. Caröe, Esq., F.R.I.B.A.

## SERIES I

Column	1	2	3	4	5	6
Description	Seventh or Ninth Century Mortar. Monkwearmouth Durham.	Westminster Abbey, from a portion of the original stonework of the first part of Henry III. original mortar (early thirteenth century)	Church at Darenth, said to be Saxon, but probably the latter part of the eleventh century.			Roman Aqueduct at Frejus, the Forum Julii of the Romans. Genuine piece of the original Roman construction from the centre of the wall Some time B.C.
			Large Sample from Church	From a Window which is either Saxon or first ten years after the Conquest	From Church	
Insoluble in dilute HCl	Per cent. 34.27	40.20	66.76	40.0	—	80.74
Soluble Silica .. ..	0.98	0.25	0.35	0.6	—	0.34
Oxide of Iron and Alumina ..	2.54	0.95	1.00	4.8	—	2.94
Lime (CaO) .. ..	33.40	26.16	16.40	30.2	—	7.64
Magnesia .. ..	Trace	1.40	Trace	Trace	—	0.07
Carbonic Acid (CO <sub>2</sub> ) ..	21.70	20.60	12.30	23.4	12.7	5.20
Sulphuric Acid (SO <sub>3</sub> ) ..	0.38	Trace	0.13	Trace	—	0.00
Organic Matter and Water of Hydration .. ..	6.73	10.44	3.06	1.0	—	Trace
Alkalies, moisture and loss	—	—	—	—	—	3.07
	100.00	100.00	100.00	100.0	—	100.00
Earthy Matter .. ..	2.37	None	2.88	None	?	3.24
Description of Earthy Matter ..	Containing 1.32 of organic matter unburnt earthy.	—	Ferruginous clay	—	Ferruginous clay	Slightly ferruginous aluminous powder.
Nature of Sand or Grit .. ..	Grey and white sand with quartz and water-worn flints.	Fine sand.	Clean sand with small black water-worn flints	Fine ferruginous sand.	—	Quartz sand with a few particles of brick, fragments of mica, grey nodules consisting of quartz, felspar, etc.
Grading of Washed Sand, etc. :						
Retained on $\frac{1}{8}$ inch mesh	Per cent. 22.4	Nil	15.8	—	Evidently similar to larger sample from the Church	Nil
" " " "	13.1	Nil	4.3	—		3.04
" " " "	16.0	8.15	14.4	—		9.22
" " " "	13.1	12.71	10.8	—		26.05
Passed " " " "	28.3	79.14	5.8	100.0		61.69
Clay, etc. .. ..	7.1	Nil	48.9	—		—
	100.0	100.00	100.0	100.0		100.00
Percentage of Clay, etc., in Grit ..	6.9	Nil	4.32	Trace	—	4.0
Lime corrected to Commercial Lime of 80 per cent. CaO ..	Per cent. 41.7	32.17	20.5	37.7	—	9.55
Volume of unslaked Lime to Sand and Grit, Com. Lime $\times 2\frac{1}{2}$ .. ..	97.3 : 34.27 = 1 : 0.3	75.0 : 40.2 = 1 : 0.5	47.8 : 66.76 = 1 : 1.4	88.0 : 40.0 = 1 : 0.4	—	22.3 : 80.74 = 1 to 3.6
Physical Character of Sample ..	Very hard, firmly adhering to stone.	Hard, white mortar.	Very hard, whitish mortar, with flints.	White, friable.	Very hard, with flints.	Very hard, white mortar, with granite chips.
Reaction .. ..	Neutral	Neutral	Alkaline	—	—	Very faintly alkaline
Free Lime .. ..	None	—	None	—	—	None
Crushing strength per cubic inch ..	323 lbs.	—	—	—	—	(180, 138, 172) av. 163 lbs.
Remarks .. ..	The aggregate contained unburnt chalk with fossils, which accounts for the high percentage of lime.	Fine sand with large proportion of lime.	Containing trace of copper.	Weight of Sample : = 0.67 gramme Too small for complete examination.	3.94 grammes Practically identical with the larger sample.	

## The Architecture Club

### PUBLIC DINNER

The Architecture Club held its first public dinner at the Hotel Cecil on 20 July. The evening, with Mr. J. C. Squire in the chair, was very successful, and some excellent speeches were made by Mr. St. Loe Strachey, the chairman, and Mr. G. K. Chesterton, among others.

The formation of this Club marks a step in the direction of greater public interest being taken in modern architecture. It is common ground that the art of architecture has been neglected by the Press and the public at large, and that it is only by stimulating the interest of the community that the general level of architecture will improve. With our dislike of anything that savours of advertising, we have perhaps erred hitherto in the contrary direction and have been shy of publicity of any sort. Perhaps we, as architects, are conscious that we are creators and that talking is not our particular province. The R.I.B.A., however, has itself done a good deal in the last few years to bring the public in touch with architecture. It has arranged lectures and has invited the Press to take note of its activities; but much remains to be done in the way of enlightenment, and an unofficial body of persons, consisting of architects and laymen, all working to further the cause of good architecture, may do much that an official professional body cannot perform, and such is the function of the Architecture Club.

The Club was the outcome of a conversation which took place some time ago between Mr. J. C. Squire, the writer and editor of *The London Mercury*, and myself. He was greatly interested in architecture, and was very much aware that the general mass of modern building is of poor quality architecturally, and wanted to get the voice of the Press to assist in bringing about a better state of things. It was agreed that a liaison between architects, writers, and newspapermen was necessary if this work was to be done on the right lines. Subsequently, meetings and informal dinners between a number of architects and pressmen took place, and the outcome of these was the founding of the Club.

The chief object of the Club is to enlarge public appreciation of good architecture and the allied arts, and especially of the best work of to-day. The membership is strictly limited in number, and consists of practising architects and laymen. The laymen, who are to outnumber the architects by two to one, are men of influence in the journalistic world, writers and prominent persons who can further the objects of the Club. Mr. Thomas Hardy, O.M., has consented to become the Hon. President. It has been encouraging to the promoters of the scheme to find what ready and practical interest has been taken in the Club by people in all walks of life, and how the idea has been welcomed. The Club is formed on broad lines; it will not concern itself with architectural politics—its sole aim and purpose is the improvement of English architecture in town and countryside.

OSWALD P. MILNE [F.].

## Obituary

### THE LATE MR. R. M. ROE [F.]

Richard Mauleverer Roe, who passed away on 30 July, in his 68th year, was a son of the late George Charles Lionel Roe, of Roesborough, co. Tipperary, his mother being a member of the Mauleverer family.

He commenced his professional career by serving articles with the firm of Beeston, Son, & Brereton, and afterwards fulfilled engagements with Mr. Cross (Bedford Estate Office), Mr. Lewis Holmes, and Messrs. Davis & Emanuel successively. He began to practise on his own account in Basinghall Street in 1881, and a few years later he took into partnership the late G. Richards Julian, though in 1892 this was dissolved by mutual consent. In 1915 he took into partnership his brother-in-law, J. Charles Bourne [*Licentiate*], who had been his assistant for many years previously.

Mr. Roe's practice was chiefly confined to the City of London, his executed works there consisting of office and business premises, in many of which his skill in overcoming the difficulties imposed by sites of irregular shape or restricted area is a marked feature. Where the available expenditure permitted anything more than a severely simple treatment, his designs are characterised by much taste and refinement in detail, and frequently show the extent to which he was influenced by the work of the early French Renaissance. The best example of his work is probably Gort House, at the corner of Mark Lane and Great Tower Street, built during the period of his partnership with Mr. Julian. Among other works may be mentioned the following houses in Basinghall Street: No. 57, Nos. 62 and 63, No. 64, Nos. 65 and 66, No. 70A (Bassishaw House), and Dunedin House in Basinghall Avenue. He was also responsible for No. 83 Cannon Street, Nos. 74 and 75 Cheapside, Nos. 36 and 37 Queen Street, Nos. 129 and 130 Fleet Street, and other buildings. He acted as architect, during a long period, for the City properties of the late Sir Tollemache Sinclair, Bart., for whom he designed several buildings in Fleet Street at the time that the scheme for widening that thoroughfare was being carried out. Though his work lay principally in the City, he also prepared the plans for houses erected at Hindhead by the late Mr. John Grover, and was responsible for important additions and alterations to Red Rice, Hampshire, for Lord Grantley. When the Cole Park estate at Twickenham was being developed some years ago, he acquired land there and erected about a dozen residences, one of them (Crane House) for his own occupation. These houses are characterised by much charm and individuality.

Mr. Roe was a rapid worker, and his designs, from the preliminary sketches to the full-size details, were usually the work of his own hand entirely. He had a great love for dramatic art and literature, and, being an accomplished French scholar, he produced admirable translations of several notable plays from that source.

Mr. Roe was elected an Associate in 1881 and a Fellow in 1889. He married Lilla, daughter of his former master, Mr. F. R. Beeston, and she survives to mourn his loss.

J. C. B.

## Tenth International Congress of Architects, Brussels

4-11 September 1922

The Tenth International Congress of Architects will be held under the auspices of the Société Centrale d'Architecture de Belgique in Brussels from 4 to 11 September 1922, and will be accompanied by an International and a National Retrospective Architectural Exhibition.

It will be remembered that the outbreak of the war interrupted the preparations for the Tenth Congress of the regular series, which was to have been held in Petrograd in May 1915 under the patronage of the late Tsar.

The Société Centrale de Belgique will be celebrating the fiftieth anniversary of its foundation at the time of the Congress, and the architects of Belgium extend a cordial invitation to their foreign colleagues to join them in the celebration.

The Congress will include delegates from many foreign countries. The Belgian Committee is under the chairmanship of M. J. J. Caluwaerts, with M. R. Moenaert as secretary.

### PROGRAMME.

- 4 Sept. *Morning*.—Meeting of the Permanent Committee of the International Congress of Architects.  
2 p.m.—Formal opening in the Palais des Academies.  
*Evening*.—Reception.
- 5 Sept. 10 a.m.—Opening of the Architectural Exhibition in the Palais d'Egmont.  
2-6 p.m.—Conferences.  
*Evening*.—Receptions.
- 6 Sept. 9 a.m. to Noon.—Visits to buildings of interest in Brussels.  
2-6 p.m.—Conferences.  
*Evening*.—Receptions.
- 7 Sept. Visits to the devastated zone, stopping at Ypres, and spending the night at Bruges.
- 8 Sept. Visits about Bruges, returning to Brussels in the evening.
- 9 Sept. Excursion to Antwerp, visits about the city and up the Scheldt.  
2-5 p.m.—Conferences, returning to Brussels in the evening.
- 10 Sept. 9 a.m. to Noon.—Visits to the Exposition.  
2-6 p.m.—Conferences.  
*Evening*.—Receptions.
- 11 Sept. 10 a.m.—Closing exercises.

### SUBJECTS FOR DISCUSSION.

1. The responsibilities of the architect.
2. Schedule of charges.

3. The appointing of State and Municipal architects.
4. The rights of authorship of the architect.
5. The profession of architecture: its aims and its rights.
6. Women architects.
7. Public, national, and international competitions. The position of the winning architect in an international competition or of one working in a foreign country.
8. Town planning.
9. Small houses.
10. The influence of locality on architecture.
11. The preservation of historic monuments: with consideration of their economic, hygienic, and social aspects.

### EXHIBITIONS.

An Architectural Exhibition will open 5 September in the Palais d'Egmont, lasting two weeks.

It will be divided in two general classes: (a) Belgian—1 Retrospective, 2 Contemporaneous; Jury, Messrs. Maukels, Mercenier, and Van Montfort. (b) Foreign—there will be as many sections as there are countries represented.

### DUES.

The dues for members will be 50 francs; for ladies accompanying members (wives and daughters only) 30 francs, which will give them the privilege of visits, excursions, and receptions.

### LANGUAGE.

Official delegates may address the meetings in their own language. The official language of the Congress will be French, though any other language may be used provided a *résumé* in French is submitted at the same time.

### BRITISH ARCHITECTS INVITED.

All British architects are cordially invited to take part in the Congress.

All those desiring to attend or to receive further information should communicate with

THE SECRETARY,

The R.I.B.A.,

9, Conduit Street, W.1.

The President and Mr. Edward P. Warren have been appointed delegates of the Institute at the International Congress.



## R.I.B.A. Committees

SESSION 1922-23

The following Boards and Committees have been appointed by the Council for the Session 1922-23:—

**FINANCE AND HOUSE COMMITTEE.**—The President, the Hon. Secretary, Messrs. Sydney Perks, F.S.A., H. D. Searles-Wood, Stanley H. Hamp.

**FELLOWSHIP DRAWINGS COMMITTEE.**—The President, the Hon. Secretary, Messrs. E. P. Warren, Heaton Comyn, C. Lovett Gill.

**THE ROYAL GOLD MEDAL COMMITTEE.**—The President, Messrs. A. W. S. Cross, George Hubbard, H. D. Searles-Wood, C. Heathcote, the Hon. Secretary, Mr. J. A. Gotch, Sir Edwin L. Lutyens, R.A., Sir Reginald Blomfield, R.A., Messrs. Francis Jones, C. B. Flockton, Heaton Comyn, T. R. Milburn, E. P. Warren.

**BOARD OF ARCHITECTURAL EDUCATION.**—The President, the Hon. Secretary, Messrs. H. D. Searles-Wood, George Hubbard, A. W. S. Cross, Professor S. D. Adshead, Messrs. Robert Atkinson, H. Chalton Bradshaw, Walter Cave, E. Guy Dawber, Professor A. C. Dickie, Messrs. H. M. Fletcher, W. Curtis-Green, Sir Robert S. Lorimer, A.R.A., Professor Beresford Pite, Mr. W. S. Purchon, Professor A. E. Richardson, Professor C. H. Reilly, O.B.E., Messrs. Alan E. Munby, H. Austen Hall, E. Stanley Hall.

**TOWN PLANNING COMMITTEE.**—The President, the Hon. Secretary, Professor Patrick Abercrombie, M.A., Professor S. D. Adshead, M.A., Mr. Robert Atkinson, Major Harry Barnes, M.P., Sir Reginald Blomfield, R.A., Messrs. Walter Cave, Arthur Crow, T. Raffles Davison, W. R. Davidge, F. M. Elgood, Edwin T. Hall, W. Haywood, Col. R. C. Hellard, C.B., Sir Herbert Jekyll, Messrs. H. V. Lanchester, H. J. Leaning, Professor W. R. Lethaby, Sir Edwin Lutyens, R.A., Mr. D. Barclay Niven, Professor Beresford Pite, M.A., Messrs. C. H. B. Quennell, W. E. Riley, R.B.A., W. H. Seth Smith, Herbert Shepherd, John W. Simpson, Raymond Unwin, Sir Aston Webb, P.R.A.

**THE COMPETITIONS COMMITTEE.**—The President, the Hon. Secretary, Professor Patrick Abercrombie, M.A., Messrs. W. H. Ansell, M.C., Henry V. Ashley, G. Leonard Elkington, L. Rome Guthrie, E. Vincent Harris, H. V. Lanchester, F. Winton Newman, William A. Pite, T. Taliesin Rees, J. Douglas Scott, Septimus Warwick, Herbert A. Welch, W. G. Wilson.

**THE R.E. MESS MEMORIAL COMMITTEE.**—Messrs. Horace Cubitt, Gilbert Fraser, T. F. W. Grant, M.C., Maurice E. Webb, D.S.O., M.C.

**THE LONDON BUILDING ACTS COMMITTEE.**—The President, the Hon. Secretary, Professor S. D. Adshead, Messrs. Walter Cave, Horace Cubitt, W. R. Davidge, C. A. Daubney, E. Guy Dawber, F.S.A., Matt. Dawson, Sir Banister Fletcher, Messrs. H. Austen Hall, George Hubbard, F.S.A., J. J. Joass, Delissa Joseph, Sydney Parks, F.S.A., H. D. Searles-Wood, Digby, L. Solomon, B.Sc., Sir Henry Tanner, C.B., I.S.O.

**THE REGISTRATION COMMITTEE.**—The President, Messrs. H. D. Searles-Wood, George Hubbard, A. W. S. Cross, M.A., C. Heathcote, the Hon. Secretary, Messrs. W. Gillbee Scott, C. B. Flockton, Sydney Perks, F.S.A., Delissa Joseph, Herbert Shepherd, W. G. Hunt, H. G. Fisher, Major Harry Barnes, M.P., Messrs. Arthur Welford, W. E. Riley, Heaton Comyn, W. R. Davidge, T. R. Milburn, A. O. Collard, Frank Woodward, G. Topham Forrest, Percival M. Fraser, L. A. Culliford, C. Lovett Gill, W. W. Scott-Moncrieff.

**THE CHARTER AND BY-LAWS COMMITTEE.**—The President, Messrs. A. W. S. Cross, M.A., C. Heathcote, George Hubbard, H. D. Searles-Wood, the Hon. Secretary, Messrs. W. H. Ashford, Max Clarke, Sydney Perks, F.S.A., Herbert Shepherd, J. A. Swan.

**THE SESSIONAL PAPERS COMMITTEE.**—The President, the Hon. Secretary, Messrs. Martin S. Briggs, Walter Cave.

**THE ANNUAL DINNER COMMITTEE.**—The President, the Hon. Secretary, Messrs. Walter Cave, William Woodward.

**ADDITIONAL MEMBERS TO THE FOUR STANDING COMMITTEES.**

**ART STANDING COMMITTEE.**—Messrs. F. R. Hiorns, W. R. Davidge, C. Lovett Gill, H. P. Burke Downing, Walter Tapper.

**LITERATURE STANDING COMMITTEE.**—Messrs. J. A. Gotch, Harry Sirt, Basil Oliver, L. A. Culliford, W. H. Ward.

**PRACTICE STANDING COMMITTEE.**—Messrs. T. R. Milburn, Percival M. Fraser, Francis Jones, Harry Teather, W. Henry White.

**SCIENCE STANDING COMMITTEE.**—Messrs. J. Ernest Franck, S. B. Russell, E. Fiander Etchells, J. E. Dixon-Spain, A. W. Moore.

## Competitions

### COMPETITION FOR REBUILDING NEW-MARKET HOTEL, BURY.

The following copy of a notice has been issued by the Council of the Institute:—"Members and Licentiatees of the Royal Institute of British Architects must not take part in the above competition because the conditions are not in accordance with the published Regulations of the Royal Institute for Architectural Competitions."

### CHELSEA HOSPITAL FOR WOMEN.

The Council of the Chelsea Hospital for Women propose to invite not more than twelve Architects to submit Designs, in Competition, for their proposed Nurses' Home (some 100 bedrooms, etc.), to be erected in the Hospital grounds.

Premiums of £150, £100 and £50 will be paid to the Authors of the Designs placed 1st, 2nd and 3rd respectively. The Council have appointed Mr. Henry V. Ashley, F.R.I.B.A., to draw up the Conditions and Instructions of the Competition, and to adjudicate thereon.

Architects willing to compete are requested to send in their names to the Secretary on or before September 16 1922 together with their qualifications.

By Order of the Council,

HERBERT H. JENNINGS,  
Secretary.

Arthur Street,  
Chelsea, S.W.3.

### COLOMBO TOWN HALL AND MUNICIPAL OFFICES COMPETITION.

The Secretary of the Institute has received a cable from the Municipality of Colombo to the effect that the above Competition is restricted to architects practising in the East.

### COMPETITIONS OPEN.

Southend-on-Sea Secondary School.  
Lytham Public Hall and Baths.

The conditions and other documents relating to the above competitions may be consulted in the Library.



# The Examinations

## INTERMEDIATE.

The Intermediate Examination, qualifying for registration as Student, R.I.B.A., was held in London from 9 to 15 June. Of the 111 candidates who presented themselves 26 passed and 85 were relegated. The successful candidates were as follows, the names being given in order of merit as placed by the Examiners:—

- WHITE: Leonard William Thornton [P. 1920], 18, Mayfield Street, Hull.  
 MCKEWAN: Arthur Malcolm [P. 1922], 27, Somerset Road, Handsworth Wood, Birmingham.  
 VINE: Ronald Owen [P. 1920], 7, Whymark Avenue, Wood Green, N.22.  
 \*MONTAGU: Adrian, 7, Chadwell Street, Myddleton Square, E.C.1.  
 COATES: Harold John [P. 1920], c/o W. E. Watson, Esq., 9, Mitre Court Chambers, Temple, E.C.4.  
 FILLMORE: Cecil Ernest Millard [P. 1922], Newhaven, Hollyhedge Road, West Bromwich.  
 MCMANUS: Sydney Charles [P. 1922], 675, Wandsworth Road, Clapham, S.W.8.  
 GRAY: Charles Clare [P. 1920], 81, Sutton Crescent, Walsall.  
 HODGES: Alfred Walter [P. 1920], 10, Fortescue Road, St. Thomas, Exeter.  
 WILDE: George [P. 1920], 98, Brewerton Road, Oldham.  
 CUTHBERTSON: Dale [P. 1920], 2, Grisedale Street, High Westwood, Hamsterley Colliery, co. Durham.  
 FELGATE: Eric George [P. 1914], 11, Victory Road, Ilkley.  
 FORD: Walter Henry [P. 1920], Fairford, 28, St. Mary's Grove, Chiswick, W.4.  
 BYERS: John [P. 1921], Dockray Bank, Wigton, Cumberland.  
 GOUGH: Gerald Charles Purcell [P. 1922], Sunny Mead, 14 Sands Road, Paignton, S. Devon.  
 PRANGNELL: Cecil Thomas [P. 1921], 43, Edmund Street, Camberwell, S.E.5.  
 BRAGG: George John [P. 1920], 21, Clements Road, East Ham, E.6.  
 COWSER: Benjamin [P. 1921], 32, Agincourt Avenue, Belfast.  
 GEESON: Alfred Godwin [P. 1921], 27, Park View, Stapleford, Notts.  
 GREEN: Ralston Tilsley [P. 1917], 37, Manor Park, Redland, Bristol.  
 BARNESLEY: Geoffrey Reynolds [P. 1919], 2, Eastholm, Letchworth, Herts.  
 CARTER: Richard Jeffery [P. 1919], 37, Hamilton Road, Reading.  
 ECCLESTONE: Arthur William [P. 1918], 34, Victoria Road, Great Yarmouth.  
 ENGLAND: Norman Roderick [P. 1918], 24, Bromley Road, St. Annes-on-the-Sea, Lancs.  
 RICHARD: John Cyril [P. 1918], 71, Whitchurch Road, Cardiff.  
 TAYLER: Kenneth Seaward [P. 1920], Ivy Court, Brookside, Chesterfield.

## THE FINAL AND SPECIAL.

The Final and Special Examinations, qualifying for candidature as Associate, R.I.B.A., were held in London from 22 to 29 June. Of the 33 candidates admitted, 17 passed the entire examination, 2 passed Part I. (having elected, in accordance with the regulations, to take the examination in two parts), and the remaining 14 were relegated. The successful candidates are as follows:—

- BAILLIE: William [Special], 78, Park Drive S., Whiteinch, Glasgow.

- BALL: William Arthur Cessford [Special], 73, St. James's Road, Croydon.  
 BUTLER: Bertram [S. 1922], 31, Priory Street, Dudley.  
 GILDER: Framroz Nowroji [S. 1920], Indian Students' Hostel, Keppel Street, W.C.1.  
 GUNSTON: Edward Leslie [S. 1917], "Alpenrose," Kidmore, Reading.  
 HOFER: Max Richard [S. 1911], 68, Cambridge Terrace, W.2.  
 HUGHES: Eleanor Katherine Dorothy [S. 1921], 28, Moreton Street, S.W.1.  
 JENSON: Alexander George [S. 1920], 20, Carpenter Road, Edgbaston, Birmingham.  
 LEVERKUS: Gertrude Wilhelmine Margaret [S. 1920], 22, Gayton Road, Harrow-on-the-Hill.  
 NEWHAM: William Benjamin Turner [Special], c/o Messrs. Gutch & Saunders, Bank Chambers, Kettering.  
 \*PETROVITCH: Douchan Slobodan, 35, Bedford Square, W.C.1.  
 REID: Alexander Simpson [S. 1921], 221, Clifton Road, Aberdeen.  
 RICHARDS: Francis Augustus [Special], 60, Tufton Street, Westminster, S.W.1.  
 RYLE: Winifred [S. 1921], 16, Gordon Square, W.C.1.  
 SAWYER: Frederick John [S. 1895], Nesscliff, High Street, Addlestone, Surrey.  
 SUGDEN: Howard Davy [S. 1919], "The Heath," 2, Holford Road, Hampstead, N.W.3.  
 WILLIAMS: Albert Ernest [Special], 80, Albert Street, Camden Town, N.W.  
 ALLCORN: William John [S. 1913], The Pinnacles, Shipbourne, Tonbridge, Kent (Passed in Part I.).  
 HINES: Edward George [S. 1920], Stockwood Crescent, Luton (Passed in Part I.).
- The candidates marked \* are not British subjects, but have taken the examinations for the purpose of obtaining certificates to that effect.
- The Board have recommended that the Ashpitel Prize be awarded to Mr. A. S. Reid, of Aberdeen, he being the candidate who has most highly distinguished himself in the Final Examination, also that Mr. Reid be awarded the Thesis mark of distinction.

## THE SPECIAL WAR EXAMINATION.

The Special War Examination (for students whose studies had been interrupted by the war) was held in London and Manchester from 3 to 7 July. Of the 215 candidates admitted, 131 passed and 85 were relegated. The successful students are as follows:—

- ALLEN: Charles William, 116, Mansfield Road, Nottingham.  
 AUSTIN: Leslie Magnus, A.R.C.A., Royal College of Art, S. Kensington, S.W.  
 BACKWAY: Gerald Henry, "Torrige Mount," Bideford, Devonshire.  
 BALL: Walter Frederick, c/o Architectural Association, 34 and 35, Bedford Square, W.C.  
 BANKART: Hugh Charles, 25, Parkhill Road, Hampstead, N.W.3.  
 BARNARD: Charles Downing, 188, High Road, Leyton, E.11.  
 BATHURST: Leslie John, 50, Woodside Road, Bowes Park, N.22.  
 BUYSMAN: Cornelius James Alexander Kelder, 165, South Croxted Road, Dulwich, S.E.21.  
 BEAUFAY: Samuel Leslie George, 163, Tufnell Park Road, Holloway, N.7.  
 BEESTON: Charles Nicholson, 206B, Adelaide Road, N.W.3.  
 BEESTON, Wilfred, 92, Falkner Street, Liverpool.  
 BINGE: Joseph Wallace, M.C., The Oaklands, Acacia Grove, New Malden.

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- BIRD : Eric Leslie, 34, Bedford Square, W.C.1.  
 BLAKELEY : Tom, 28, Orchard Street, Savile Town, Dewsbury.  
 BOOKER : Alfred Vincent, 3, Montem Road, Forest Hill, S.E.23.  
 BOX : Harry Ewart, 54, Holland Road, Maidstone.  
 BRAMWELL : John, 21, Upper Duke Street, Rodney Street, Liverpool.  
 BRIARS : Reginald, "Hanover House," Tennyson Road, Luton.  
 BROADBENT : John Stewart, 36, Bruce Road, Bow, E.3.  
 BROTHERS : Colin Stanley, 49, Whitechapel, Liverpool.  
 BROWN : Walter, Architectural Association, 35, Bedford Square, W.C.1.  
 CALEY : Walter Herbert, c/o Architectural Association, 34, Bedford Square, W.C.1.  
 CARTER : George Bertram, 24, Craighton Road, Eltham, S.E.9.  
 CARTWRIGHT : Wilfred, 20, Cambridge Street, Loughborough.  
 CHISHOLM : Alexander MacLeod, 13, Euston Grove, Birkenhead.  
 CLACK : John, 104, Victoria Street, Westminster, S.W.1.  
 CORNES : Ernest Harold, Meadowside, Cambrian View, Chester.  
 CRICKMAY : Gordon Hayter, 46, Charleville Road, West Kensington, W.  
 CROWTHER : John Henry (jun.), "Craig Lea," Moorlands Avenue, Dewsbury.  
 DE BURGH : Robert Stanley, "Deer Leap," St. Cross, Farnham, Surrey.  
 DENT : Alwyn Ronald, 11, The Avenue, Barnet, Herts.  
 DIXON : Charles Guy, 31, Mount View Road, Stroud Green, N.4.  
 EASTWOOD : Frederick George, 60, King Street, Manchester.  
 EGGINS : Frank Wallis, 5, Church Street, Paignton, S. Devon.  
 ELLIS : Jack, Berryfield House, near Aylesbury.  
 FARE : Arthur Cecil, 18, New Bond Street, Bath.  
 FARRIER : Archibald Victor, 101, The Ridgeway, Wimbledon, S.W.19.  
 FLITCROFT : Alfred Crumblehulme, 172, High Street, Bolton.  
 FLUTTER : Anthony Thomas, 78, Cicada Road, Wandsworth Common, S.W.18.  
 FOREMAN : Leslie Robert, 20, Wellington Road, Brighton.  
 FRANCIS : Cecil William, 15, Savernake Road, Hampstead, N.W.3.  
 FRASER : Bright, c/o 9, Powderham Crescent, Pennsylvania, Exeter.  
 FRYER : Edgar, 46, Carter Street, Princes Road, Liverpool.  
 GADD : George Cyril, Redlands, Bromsgrove, Worcester.  
 GEORGE : Conrad Eric, 22, Caroline Street, Eaton Terrace, S.W.1.  
 GLASS : James Scott, 38, Eastwood Road, Goodmayes, Essex.  
 GOWER : Lawford Raymond, "Maes-y-coed," Shelone Road, Briton Ferry, Glam.  
 GRAY : James, 113, Dalkeith Road, Edinburgh.  
 HALL : Herbert James, 52, Paulton Square, King's Road, Chelsea, S.W.  
 HALL : Leslie William, 19, Belgrave Avenue, Watford, Herts.  
 HALL : Montagu Ashley, 3, Silver Street, Lincoln.  
 HAMPTON : James Frederick, Brooker's Farm, Beltring, Pad-dock Wood, Kent.  
 HICKEY : Patrick, "Burslem House," Whitehall Road, Grays, Essex.  
 HOLDEN : Walter Frederick Clarke, Salters Acre, Gregories Road, Beaconsfield.  
 HOPWOOD : James, 20, Baker Road, Harlesden, N.W.10.  
 HOWITT : Leonard Cecil, School of Architecture, University of Liverpool, Ashton Street, Liverpool.  
 HUBBARD : George Edward, 34, Bedford Square, W.C.1.  
 IGGLESDEN : Sidney Dixon, 23, Constantine Road, Hampstead, N.W.3.  
 JARVIS : Harold Edgar, No. 1 Bungalow, Oxford Road, Ban-bury, Oxon.  
 JOHN : Lewis, Llantrelhyd, near Cowbridge, Glam.  
 JOHNSON : William Arthur, 32, Brantwood Terrace, Morton, Manchester.  
 JONES : Thomas Edward, "Terfyn," Port Dinorwic, N. Wales.  
 KEMP : Leslie Hagger, 5, Lorrimore Square, Kennington Park, S.E.17.  
 KENDALL : Charles, The Gables, Ossett, Yorkshire.  
 KENNEDY : Colin White, c/o Architectural Association, 34-35, Bedford Square, W.C.1.  
 KILLENDER : Henry Claude, 39, Merton Road, Bootle, Lancs.  
 KING : George Edward, Forest View, 59, Forest Road East, Nottingham.  
 KINNA : Kenmure, Liberty Buildings, School Lane, Liverpool.  
 KIRBY : Stuart Cameron, 35, Bedford Square, W.C.1.  
 KNOTT : Alfred Stocker, Ashill Cottage, Pollards Hill, Nor-bury, Surrey.  
 LAMBERT : Frederick Henry, 36, Horsell Road, Highbury, N.5.  
 LIDBURY : George Victor, 262, Cavendish Road, Balham, S.W.12.  
 LIVETT : Richard Alfred Hardwick, 39, Montpelier Road, N.W.5.  
 LONSDALE : Herbert Greenhalgh, 10, Maple Grove, Prestwich, Manchester.  
 LUMSDEN : David Adams, 10A, Temple Row, Birmingham.  
 McDONALD : James Robert Angus, 38, Bede Burn Road, Jarrow-on-Tyne.  
 MACKAY : Robert Stuart Stephen, c/o Gray, 13, Richmond Terrace, Aberdeen.  
 MCNAUGHT : Robert Mackison, 9, Levenford Place, Dum-barton, Scotland.  
 McWILLIAM : Alexander, "Viewhill," Dovecot Road, Cor-storphine, Edinburgh.  
 MANSENGH : Brian George Lewis, School of Architecture, University of Liverpool, Liverpool.  
 MARR : John Gibb, 2, Osborne Place, Aberdeen.  
 MILBURN : Charles William, c/o Messrs. Clark & Moscrop, Feethams, Darlington.  
 MILNER : John Sowerby, 28, Craven Terrace, Lancaster Gate, W.2.  
 MINTY : William Stanley, 35, Craven Street, Charing Cross, W.C.  
 MONK : Sydney George, 42, Regent's Park Road, N.W.1.  
 MOODY : Herbert Line, 5, Winton Street, Ryde, Isle of Wight.  
 MOORE : Frank Allen, Knowle House, Knowle, Bristol.  
 NEWSUM : Arthur Thorpe, 62, Derby Road, Long Eaton, near Nottingham.  
 NOBLE : Charles, 52, Old Hall Lane, Withington, Manchester.  
 NUTT : Edward James, 57, Holgate Road, Nottingham.  
 O'CONNOR, Edward Dominic, Kirby Muxloe, Leicester.  
 PAGE : Eric Charles Randle, 32, Morden Road, Newport, Mon.  
 PALMER : Kenneth, 7, Beech Avenue, Gatley, Cheshire.  
 PARKER : John Kilgour, 34, Bedford Square, W.C.1.  
 PIGGOTT : John Robert, 227, Westmount Road, Eltham, S.E.9.  
 PIKE : Charles William, Savernake House, Dorchester.  
 PRITCHARD : Harold William, 22, Stamford Street, Liverpool.  
 QUARMBY : George Gilbert, "Uplands," Glen View Road, Burnley.  
 RAE : Donald Cameron, 217, Union Street, Aberdeen.  
 RANKINE : Andrew, 14, Beresford Avenue, Hull.  
 REES : John Frederick, "Brentor," 16, Fields Road, Newport, Mon.  
 RILEY : Herbert George, 25, Horsefair Street, Leicester.  
 ROGERS : William Jelf, 168, Stow Hill, Newport, Mon.  
 ROSS : David John Alexander, Woodside, Inshes, Inverness.  
 SCOTT : Herman Alexander, 134, Gloucester Terrace, Hyde Park, W.  
 SHEPHERD : John Chiene, 51, Torrington Square, W.C.1.  
 SILK : Guy Whitehall, 19, Belsize Park Gardens, N.W.3.  
 SKIPPER : Eric Hayward, 13, Broadhurst Gardens, N.W.6.  
 SKIPWITH : Lionel Ernest, 34, Bedford Square, W.C.1.

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 STILLMAN : Cecil George, The Castle, Winchester.  
 STRIBLING : Herbert James, "Graffham," Sussex Place, Slough.  
 SUTHERS : Stanley Holt, 2, Tilmore Road, Petersfield.  
 TANNER : Charles Puget, 110, St. George's Terrace, Jesmond, Newcastle-upon-Tyne.  
 TAYLOR : William Logan, The Schoolhouse, Kintore, Aberdeenshire.  
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 WILLIAMS : Walter Phillips Wynne, 107, East Dulwich Grove, S.E.22.  
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 YATES : Charles William, 71, Worrall Road, Clifton, Bristol.  
 YOUNG : John Reeve, 4, Grant Road, Wealdstone, Harrow.  
 YOYALL : Thomas, 8, Church Street, Burslem, Staffs.

## Members' Column

*Members, Licentiates, and Students may insert announcements and make known their requirements in this column without charge. Communications must be addressed to the Editor, and be accompanied by the full name and address. Where anonymity is desired, box numbers will be given and answers forwarded.*

### OFFICE WANTED.

AN ASSOCIATE of the Institute would like to share the expense of an office with another architect.—Apply Box 400, c/o Secretary R.I.B.A., 9, Conduit Street, W.

### PARTNERSHIPS.

ARCHITECT and Surveyor of many years' standing desires to meet with a competent partner with some capital to take over his practice.—Domestic and Estate work principally. Please state age and experience.—Apply Box 83, c/o Secretary R.I.B.A., 9, Conduit Street, London, W.1.

A.R.I.B.A. desires purchase partnership in established practice, South Africa, Japan, China or South America; 35 years' varied experience London and abroad. Speaks French and Italian; good working knowledge reinforced concrete construction, quantity surveying, used to responsibility building and engineering works, control of native workmen, and general office administration. Only small capital available.—Apply Box 76, c/o Secretary R.I.B.A., 9, Conduit Street, London, W.1.

ASSOCIATE (43), fully qualified, including quantities, desires to purchase partnership in established practice in Manchester district.—Address Box 88, c/o Secretary R.I.B.A., 9, Conduit Street, London, W.1.

A.R.I.B.A. with moderate capital desires junior partnership or position leading to same, with a firm practising in Glasgow, West of Scotland or Edinburgh preferred. Advertiser used to responsibility in large offices.—Reply Box 500, c/o Secretary R.I.B.A., 9, Conduit Street, W.1.

### DISSOLUTION OF PARTNERSHIP.

THE Partnership hitherto carried on by Brewill and Bailly, F.F.R.I.B.A., 44, Parliament Street, Nottingham, Architects, is dissolved by mutual consent as from 10 July 1922. A. W. Brewill will continue to practise at 1 Low Pavement, and B. E. Bailly will continue to practise at 44 Parliament Street.

### CHANGE OF ADDRESS.

MR. ANTHONY WILSON, Licentiate R.I.B.A., has changed his address to 7 Abercorn Place, St. John's Wood, N.W.8. (Telephone : Hampstead 1347.)

### RESUMPTION OF PRACTICE.

MR. EVELYN SIMMONS, Licentiate R.I.B.A., has pleasure to announce that he has resumed his architectural practice at Palace Chambers, Bridge Street, Westminster, S.W.1.

### APPOINTMENTS WANTED.

STUDENT R.I.B.A. (21), with three years' service in busy provincial office, desires experience in London.—Apply Box 98, c/o Secretary R.I.B.A., 9, Conduit Street, London, W.1.

ASSOCIATE (26) desires position as Assistant in the office of an Architect holding a public appointment. Seven years' experience. Working and detail drawings, specifications and quantities. Ex-officer.—Apply Box No. 94, c/o Secretary R.I.B.A., 9, Conduit Street, London, W.1.

A.R.I.B.A. requires post as Assistant in London. Age 31, twelve years' first-class provincial experience, three years Chief Assistant. University architectural training; excellent references. Moderate salary for London experience.—Apply Box 72, c/o Secretary R.I.B.A., 9, Conduit Street, London, W.1.

ASSOCIATE with thorough general experience as chief assistant in London office desires senior post at home or abroad. Age 31. M.A. (Cantab). Five years' war experience in Royal Engineers.—Apply Box 600, c/o Secretary R.I.B.A., 9, Conduit Street, W.1.

LICENTIATE R.I.B.A., 25 years' experience (10 years private general practice), desires partnership in sound firm. Able to introduce some work, small capital. Good experience in all branches; energetic.—Apply Box 700, c/o Secretary R.I.B.A., 9, Conduit Street, W.1.

### APPOINTMENTS VACANT.

ARCHITECTURAL ASSISTANT WANTED FOR HONG KONG.—Age 25-32. Five years' agreement. Salary, 350 Mexican dollars a month for two years; 400 Mexican dollars a month for three years (present value of dollar 2s. 7½d.). Passage paid out and home, plus £10 expenses. Option of renewal at end of three years.—Apply in first instance to Mr. Gerald G. Wood, M.Inst.C.E., at Norfolk House, Brandon, Suffolk, who will arrange for an appointment in London.

PUPIL ARCHITECTURAL ASSISTANT TO THE ARCHITECT TO THE BEIRA AND MASHONALAND AND RHODESIA RAILWAYS.—(1) The successful candidate should have passed the London Matriculation or other similar Examination accepted by the R.I.B.A. for admission as a Probationer. (2) He must be articled to the Chief Engineer of the Beira and Mashonaland and Rhodesia Railways, and give an undertaking he will study for and pass the Examination for Associate Membership of the R.I.B.A. when he reaches eligible age. (3) Pay, on arrival at Bulawayo, £250 per annum, rising by annual increments to a maximum of £350 per annum. After passing three years' pupillage and the Examination for Associate R.I.B.A. he will be placed in a higher grade of Architectural Assistant. (4) First class fare out will be paid. (5) Certain allowances and railway privileges will also be given.—Applications, stating age, qualifications, references, etc., should be addressed to the Secretary R.I.B.A., 9, Conduit Street, London, W.1.

Arrangements have been made for the supply of the R.I.B.A. JOURNAL (post free) to members of the Allied Societies who are not members of the R.I.B.A. at a specially reduced subscription of 12s. a year. Those who wish to take advantage of this arrangement are requested to send their names to the Secretary of the R.I.B.A., 9, Conduit Street, W.1.

Dates of Publication.—1921: 12th, 26th November; 10th, 24th December. 1922: 14th, 28th January; 11th, 25th February; 11th, 25th March; 8th, 22nd April; 6th, 20th May; 3rd, 17th June; 15th July; 19th August; 23rd September; 21st October.

